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THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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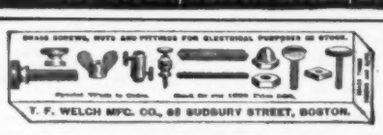

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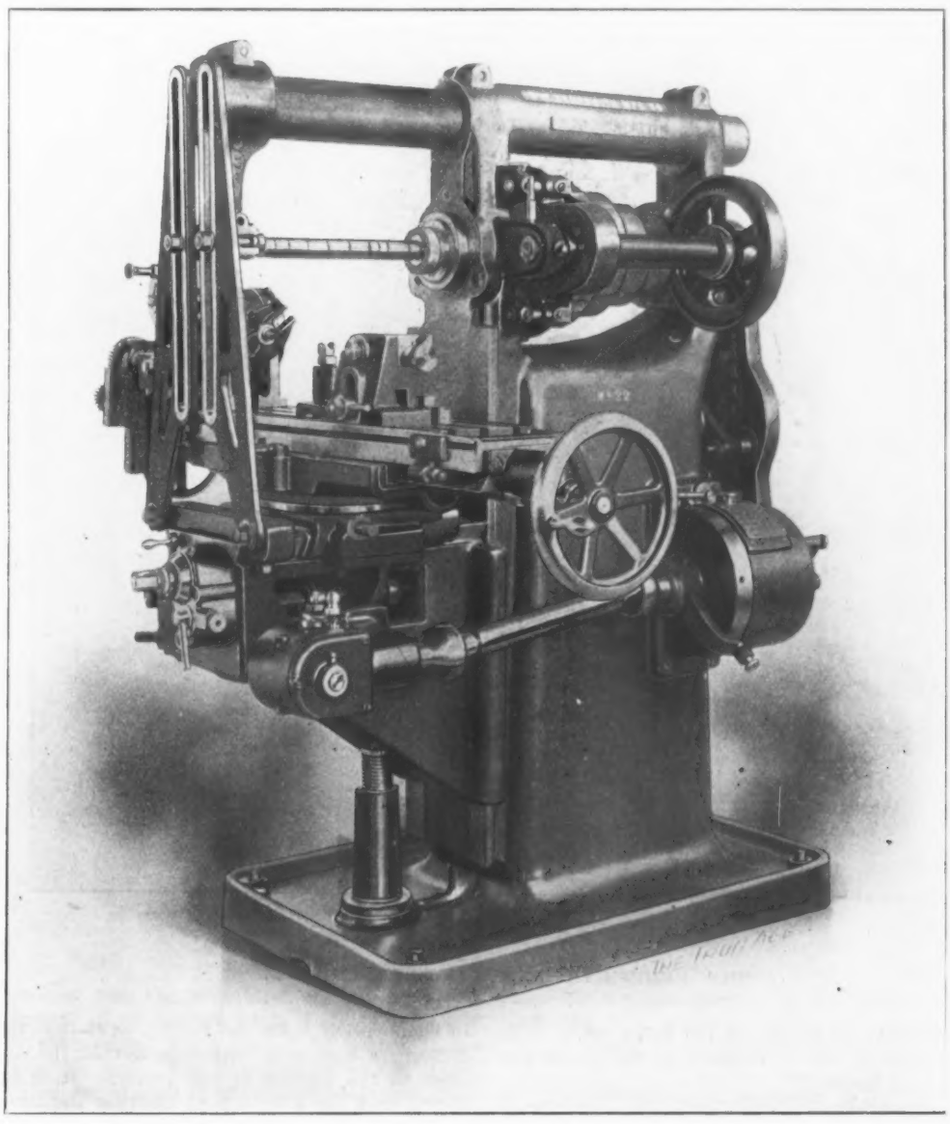
THE IRON AGE

THURSDAY, JUNE 4, 1903.

The Kempsmith New Universal Miller.

The new model universal milling machine designed recently by the Kempsmith Mfg. Company of Milwaukee, Wis., shown in the accompanying illustrations, is made from entirely new patterns and is intended to meet the new conditions in machine shop practice imposed by the new tool steels which have made it possible to drive cutters at higher spindle speeds, and to provide tables with coarser feeds than was possible when ordinary tool steels were used. In this machine these new conditions have been met by providing a heavier spindle, wider cone steps, increasing the boring surfaces on the column knee and table, and widening and deepening the column itself. The result is a machine considerably increased in weight, and prepared by stanchness of construction to meet the greater tasks imposed by modern machine shop practice.



THE KEMPSMITH NEW UNIVERSAL MILLER.

Besides the changes making the machine more powerful and rigid new features have been introduced designed to make the machine more convenient and easier to operate. To this end the handles for engaging, tripping and reversing all the feeds are at the front of the knee within easy reach of the operator, permitting closer observation of the work in hand and a better control of the table.

The method of arranging the spindle speeds and table feeds in geometrical progression in use on other millers of the same manufacture has been adhered to in the new machine. There are 16 spindle speeds, obtained by means of the four-step cone pulley, back gears and double friction countershaft.

The 16 changes of feed are obtained by means of a steel spur gearing in a box, Fig. 2, fastened in the side of the column at the rear. The feed change mechanism is therefore really made part of the miller, the box not being subject to operating strains incidental to an overhanging construction. Fig. 3, which is a view through the center lines of the gear shafts, shows the arrangement of the gearing. Fig. 2 shows that these gear shafts are not in the same plane in the machine, but they are so shown in Fig. 3 for the sake of clearness. The feed is direct, driven from the spindle of the machine by means of a chain to the sprocket wheel A, which is keyed

to its shaft. B is a sliding clutch operated by the eccentric shaft C and lever No. 1, Fig. 2, and may be engaged with either D or E, which in turn will transmit a fast or slow motion to the cone gears on the shaft F. Cone gears corresponding to those on the shaft F are mounted on the shaft G in the swinging cage H. This cage carries four intermediate or idle gears J, which are made to alternately engage in different pairs of the cone gears by means of the lever No. 2. The back gear K is mounted in the cage H and drives the pinion L. M and N are clutches keyed and pinned to the shaft G. O is a sleeve with a helical groove on the shaft G, operated by lever No. 3 to engage either M or N. P is the universal joint connecting with the feed works in the knee through the telescopic shaft. An index plate showing all the feeds from 0.004 to 0.150 inch per revolution of spindle is attached to the feed gear box and indicates the positions of the levers for the desired feed. As the arrangement of the figures and letters on the index plate is in the same direction as the movements of the levers the feeds may be read instantly.

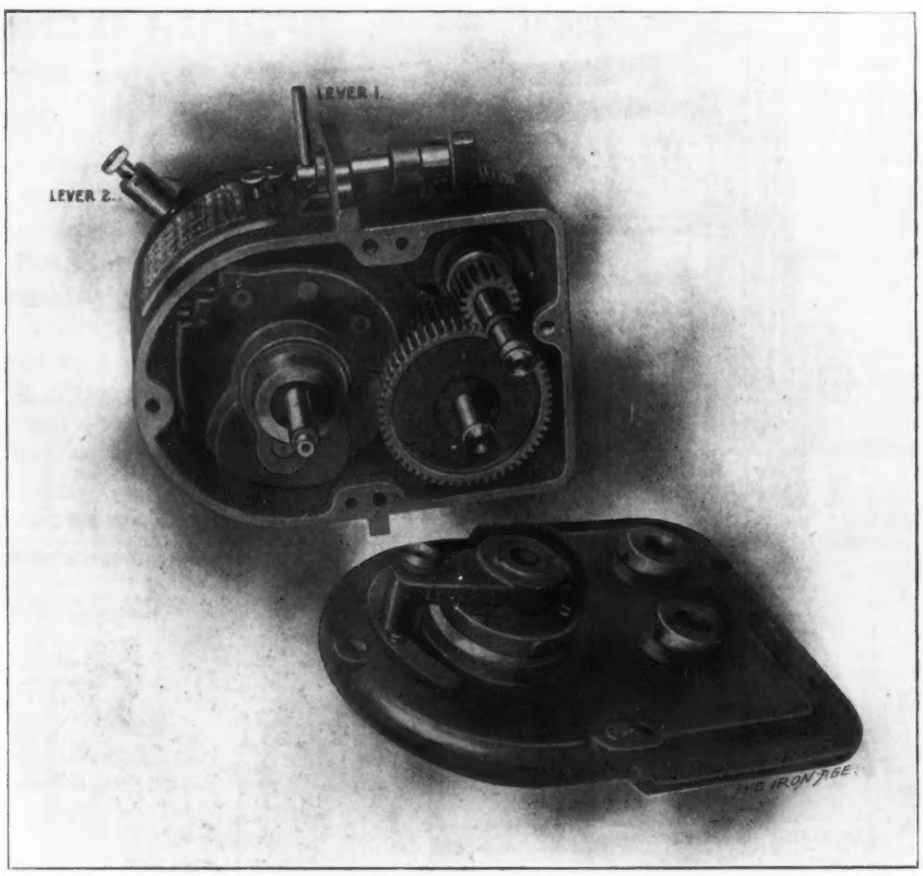


Fig. 2.—Feed Gear Box.

THE KEMPSMITH NEW UNIVERSAL MILLER.

The straight overhanging arm, heretofore a feature of some Kempsmith plain millers, has been adopted also for the universal millers. At the present time the equipment of many shops is taxed to the limit. Universal millers are frequently given work rather than have them idle even for a short time. The straight arm may therefore be pushed back flush with the face of the column, so that high pieces may be end milled close to the table of the miller or the various attachments may be put on the arm without need of reversing it, as was necessary with the goose necked type. The vertical screw is now telescopic and permits the lowering of the knee and the table the full distance of the feed without need for a screw hole in the floor of the foundation. The vertical or elevating screw has ball bearings for taking up the thrust.

A test of automobile trucks for commercial use was made in this city recently, to ascertain the fitness of such vehicles for every day use. Those tried were steam and gasoline driven, and weighed from 2 to 7 tons each. The accidents occurring were chiefly constructional, bent crank shafts, leaking boiler tubes and fires from oversights connected with the gasoline devices, but in the main the feasibility of carrying merchandise through the crowded streets of a large city by automobiles was demonstrated. It requires much practice, and, doubtless, a thorough familiarity with such machines on the part of the drivers of them to secure a commercial success in their use.

The question of ventilating the subway, or underground railway, in New York, has been broached, and it is stated that an exhausting current will be created by fans, which are expected to give a comparatively pure atmosphere under ordinary conditions. A contemporary in commenting upon the subject says that there are no difficulties connected with this method, the stations being close to the surface of the ground. It is not at such points that the difficulty of clearing the tunnel will be found, but midway between them. The New York Central Railway tunnel in this city is close to the surface of the streets, and has large louvers at very short distances. Notwithstanding this the ventilation is imperfect, owing to the fact that the foul air is heavier than the street air, so to call it, and consequently remains at the bottom, being only stirred up but not removed by each train passing through. In order to create an exhaust current which will be effective the outflow of the tunnel should be taken from the bottom of it, and there are many difficulties which will be encountered in doing this.

As a result of the unprecedented drought the water in the Hudson River was last week reported so low at Mechanicsville, N. Y., that the big dam there could not supply sufficient power for the United Traction Company's trolley lines in Troy and Albany.

Utilization of Indiana Water Powers.

INDIANAPOLIS, IND., May 30, 1903.—The failure of natural gas as fuel in Indiana, the high price of coal and the unsteadiness of its supply have turned the attention of the manufacturing interests to the swiftly flowing rivers of this State, which, before the general utilization of steam, were used largely for running flour and lumber mills and other manufacturing purposes. Members of the Government Geological Survey who are now examining the rivers in the northern part of the State are much impressed with the capabilities of the Eel, Tippecanoe, Mississinewa, Salamonie and Wabash rivers and look for a great demand along these water courses in developing electric power, partly because of the improvements that have been made in electric power transmission and because of the economic fact that water power transformed into electric power is intrinsically able to compete with other forms of energy.

Probably the greatest demand for power in the State at present comes from the interurban electric lines. In the development of interurban roads Indiana does not stand lower than second place among the States, if she does not take the lead. The examination of the rivers named has gone far enough to show that while few great power sites are available, there are a large number of sites of moderate power for the transmission of electricity. The Geological Survey is establishing current meter measurement stations at important points to ascertain the average flow of the streams and the minimum amount of power that may be counted on. The investigation includes the practicability of draining that part of the flat, marshy Kankakee basin that is within Indiana, with the double purpose of reclaiming the land and using the water to increase the flow of the streams whose head waters adjoin the basin. Some of the smaller rivers have considerable fall and admirable sites for the development of power, but the flow is small because of the comparatively limited drainage area, and it may be feasible to increase this with the excess waters of the basin. The investigations are under the direction of Hydrographer M. O. Leighton, Assistant Engineer Edward Johnson and engineers and officials of the State of Indiana.

German Ordnance to Be Purchased.

The War Department, according to a Washington dispatch, has decided to contract with the Erhardt Company of Dusseldorf, Germany, for the manufacture of 50 modern field guns, carriages and limbers complete. The guns are to be made from designs recently approved by the chief of ordnance. These designs include a number of the features of the Erhardt gun, an order having already been placed with the American & British Mfg. Company of New York for 50 guns of the same type.

The Erhardt Company, however, having explained that they will be able to deliver 50 of the same guns within seven months, General Crozier decided to order 50 in this country and 50 from the Dusseldorf firm. General Crozier found that all the ordnance companies of this country are overloaded with orders and that the Government would be greatly benefited by this arrangement. Capt. John W. Jones of the Ordnance Department has been ordered to Dusseldorf for the purpose of inspecting the manufacture of the guns and carriages and has also been made an acting quartermaster to enable him to attend to the shipment of the guns to this country.

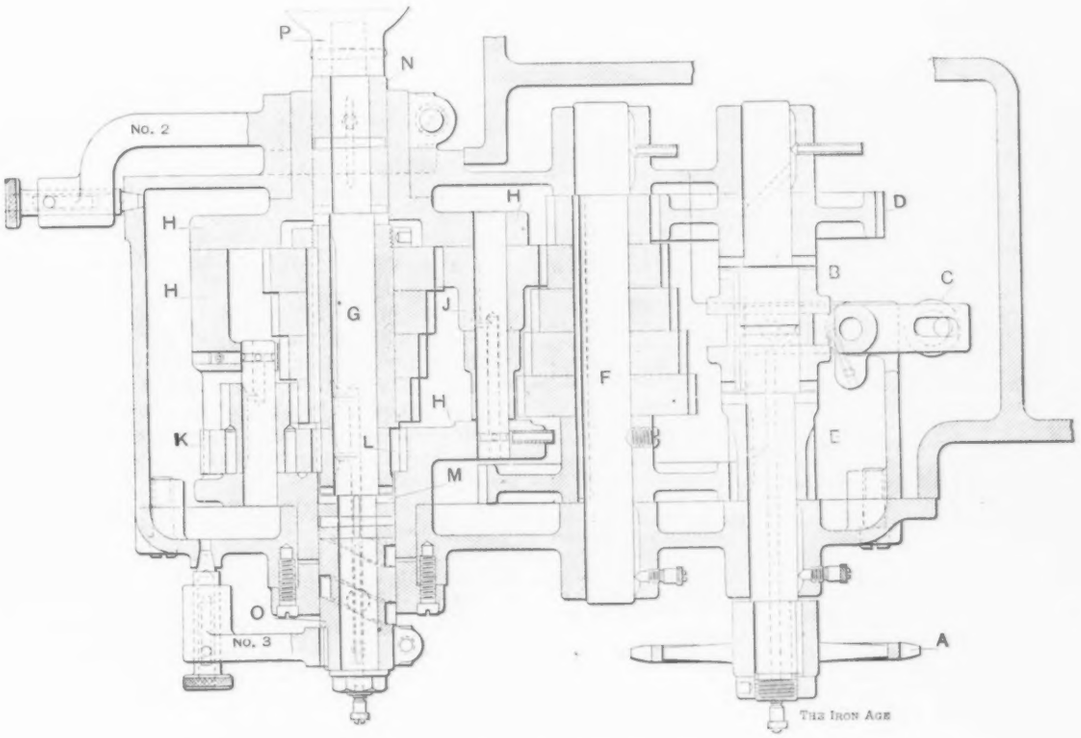


Fig. 3.—Section through Feed Gear Box.

THE KEMPSMITH NEW UNIVERSAL MILLER.

The education of engineers in various parts of the world differs but little in the branches pursued, but the attention given to certain special studies varies considerably. An article in *Nature* upon this topic reviews it at some length, and citing three American technological institutes and three foreign of the same class, it states that in Yale College the number of students in the civil engineering, mining, mechanical engineering and electricity classes fell from 209 pupils in 1895-96 to 163 in 1900-01. In two other institutes there was a decided increase in the number of scholars. In the foreign institutes the study of mathematics occupied 14 per cent. of the time, while in the American colleges it ran from 5 to 8 per cent. only. In applied mechanics the percentage of hours was 7 to 10 in this country, as against 22.5 per cent. Curiously enough the American curriculum requires more laboratory training than the foreign, and a much larger proportion of time is given to imparting skill in handicraft.

United States Shipbuilding Company.

To Be Reorganized as the Bethlehem Steel & Shipbuilding Company.

The plan for the reorganization of the United States Shipbuilding Company has been made public. Following are the leading provisions of a circular issued by the committee having the matter in charge, consisting of George R. Sheldon, Charles S. Fairchild, president of the New York Security & Trust Company; John E. Borne, president of the Colonial Trust Company; Max Pam and Charles W. Wetmore, president of the North American Company:

The plan provides for the organization of a company with the title of the Bethlehem Steel & Shipbuilding Company. The properties to be taken over are: Union Iron Works, San Francisco; Bath Iron Works, Limited, Bath, Maine; Hyde Windlass Company, Bath, Maine; Crescent Shipyard Company, Elizabethport, N. J.; Canda Mfg. Company, Carteret, N. J.; Samuel L. Moore & Sons Company, Elizabethport, N. J.; Eastern Shipbuilding Company, New London, Conn.; Harlan & Hollingsworth Company, Wilmington, Del.; also, all of the capital stock (except directors' qualification shares) of the Bethlehem Steel Company, owning the Bethlehem Steel Works and property in the boroughs of South Bethlehem and Northampton Heights.

The United States Shipbuilding Compony and said allied corporations also own merchandise, bills receivable, contracts, accounts, cash and other personal property, together with trademarks, patents and good will.

The capitalization of the present company consists of $10,000,000 of 20-year, 5 per cent. collateral and mortgage bonds; $14,500,000 of first mortgage sinking fund gold bonds; $20,000,000 of 6 per cent. noncumulative preferred stock, and $25,000,000 of common stock. The Shipbuilding Company have a floating indebtedness of $1,936,740 and the Bethlehem Steel Company a floating indebtedness of $1,398,524, making a total of $3,335,264.

The underlying liens of the Bethlehem Iron Company are $1,351,000 of 5 per cent. first mortgage bonds, and of the Bethlehem Steel Company, $7,500,000 of 6 per cent. purchase money mortgage bonds. This makes a total capitalization and liabilities of the three companies of $81,686,264.

It is proposed that the new company, in the acquisition of all the properties and assets of the Shipbuilding Company, and their constituent companies, including the Bethlehem Steel Company, and for the securing of additional cash working capital, shall issue $12,000,000 of 30-year 5 per cent. first mortgage gold bonds. These will be secured by a first mortgage bond upon all of the properties, including the plant or capital stock of the Bethlehem Steel Company and of the Bethlehem Iron Company, subject only to the underlying mortgages of those companies. The mortgage provides for continued maintenance for the first three years of the new company of $6,000,000 of working capital in excess of all indebtedness of every kind, except bonded indebtedness, and $7,000,000 thereafter.

There are to be issued voting trust certificates for $16,000,000 of 7 per cent. noncumulative preferred stock. This stock is preferred as to assets as well as to dividends. Voting trust certificates will be issued for $15,000,000 of common stock.

The holders of the present 5 per cent. collateral and mortgage bonds of the company are to receive all of the $12,000,000 of new bonds pro rata upon furnishing $2,000,000 in cash as additional working capital; also the interest due August 1, 1903, upon the bonds deposited. The holders of the first mortgage sinking fund gold bonds are to receive 100 per cent. in the new preferred stock; also the interest in cash due July 1, 1903. The remainder of the preferred stock—namely, $1,500,000—will be issued to holders of the 20-year 5 per cent. collateral and mortgage bonds.

Of the common stock, $2,900,000 is to be issued to holders of the present first mortgage sinking fund gold bonds, $1,600,000 to holders of the 20-year 5 per cent. collateral and mortgage bonds, $8,000,000, or 40 per cent. of their present holdings, to the present preferred stockholders, and $2,500,000, or 10 per cent., to the holders of the present common stock.

The total capitalization of the new company will be $43,000,000, and their fixed charges will be $517,550 for interests on the underlying bonds of the Bethlehem Iron and the Bethlehem Steel companies, and $600,000 on the first mortgage bonds of the new company, a total of $1,117,550. To this should be added, after the first five years, $250,000 per annum for the sinking fund, to retire the new first mortgage bonds. To secure continuity in the management of the new corporation, it is proposed to create a voting trust for a period of seven years. The initial voting trustees will be Charles M. Schwab, George R. Sheldon, Max Pam, Charles W. Wetmore and James H. Reed of Pittsburgh.

The plan has already been approved by the holders of large amounts of the various securities. The securities of the present company are to be deposited with the City Trust Company of this city.

While the statement is made that this plan has been approved by large security holders, it is not clear to the disinterested reader. No explanation is made as to the manner in which the floating indebtedness, amounting to $3,335,264, is to be covered, unless the assets of the company include available funds which can be used for extinguishing it. Nor does it appear how the company will get their proposed working capital of $6,000,000, as only $2,000,000 in cash will be advanced by the holders of the 5 per cent. bonds. The statement would have been more intelligible if it had been accompanied by a balance sheet. In stating that the total capitalization of the new company will be $43,000,000, the underlying Bethlehem bonds amounting to $8,851,000 are omitted. They would bring the total up to $51,851,000. They are included in the $81,686,264 given as the present "total capitalization and liabilities."

The Alan Wood Iron & Steel Company.

The Alan Wood Iron & Steel Company have been formed by the consolidation and merger of the Alan Wood Company and the Alan Wood Iron & Steel Company. The authorized capital stock is $3,500,000, of which $500,000 is 8 per cent. preferred; outstanding, $2,800,000 common, no preferred; par value of shares $100; no bonds or mortgage. The directors are: Jonathan R. Jones, Howard Wood and Richard G. Wood, Lower Merion Township, Montgomery County, Pa.; Alan W. Wood, New York City; William W. Lukens, Philadelphia.

The original Alan Wood Iron & Steel Company were incorporated in Pennsylvania in November, 1901, with $1,250,000 authorized capital stock, and in January, 1902, began the construction of a basic open hearth steel plant at Ivy Rock, Pa., about 1 mile north of Conshohocken. This plant is to consist of five 50-ton furnaces with a total annual capacity of 150,000 tons. It is expected to be in operation in July next; it will supply the sheet mills of the former Alan Wood Company at Conshohocken with slabs and billets. The sheet mills, known as the Schuylkill Iron Works, have a daily capacity of 124 tons. The business was established in 1826 and was first incorporated in 1886. The officers are: Howard Wood, president; Jonathan R. Jones, secretary and treasurer. The Philadelphia office is located at 519 Arch street.

How rapidly the German works are putting in gas engines is shown from the following list of Koerting engines which the Maschinen A. G. Gebrueder Klein of Dahlbruch have now under construction: Differdingen, a twin engine for a rod mill of 775 mm. diameter, and 1300 mm. stroke, developing 2000 horse-power at 100 revolutions; a duplicate thereof for the Roechling Works at Voelklingen; a twin engine for the Bochum Works for blowing engines, with 750 mm. diameter, 1300 mm. stroke, developing 1400 horse-power at 80 revolutions; a single cylinder engine for driving a dynamo for the same company with 750 mm. diameter and 1100 mm. stroke, developing 700 horse-power at 100 revolutions; a single cylinder engine for the same purpose, rated at 600 horse-power, for the Hoesch Works at Dortmund; a 700 horse-power single cylinder engine for driving a train for rolling mine rails for the Phœnix Works at Laar; a 1750 horse-power twin cylinder engine running at 80 revolutions for operating a blowing engine for Fr. Krupp of Essen, and two 700 horse-power single cylinder engines to drive dynamos for the Bochum Verein. The first of this series of engines will be completed in about four months.

The Fairmont Steel Company, Fairmont, W. Va., recently organized with a capital stock of $100,000, are erecting a mill for the rerolling of old rails into lighter sections for mine use. The plant will be ready for operation by November 1. Later the company intend to enlarge the works and manufacture a variety of products. The officers and directors are Jno. A. Clark, president; Clyde S. Holt, vice-president; W. J. La Follette, secretary; Walter Miller, treasurer; J. M. Hartley, T. J. Costello, Jno. Phillips and George E. Miller.

Arrangements are completed for the meeting of the National Association of Machine Tool Builders at Worcester next week. The meetings will be at the Bay State House, where most of the visitors will be quartered. The session will occupy Tuesday and Wednesday.

A Circular Storage System for 50,000 Tons of Coal.

Handling 1600 Tons of Coal in Ten Hours.

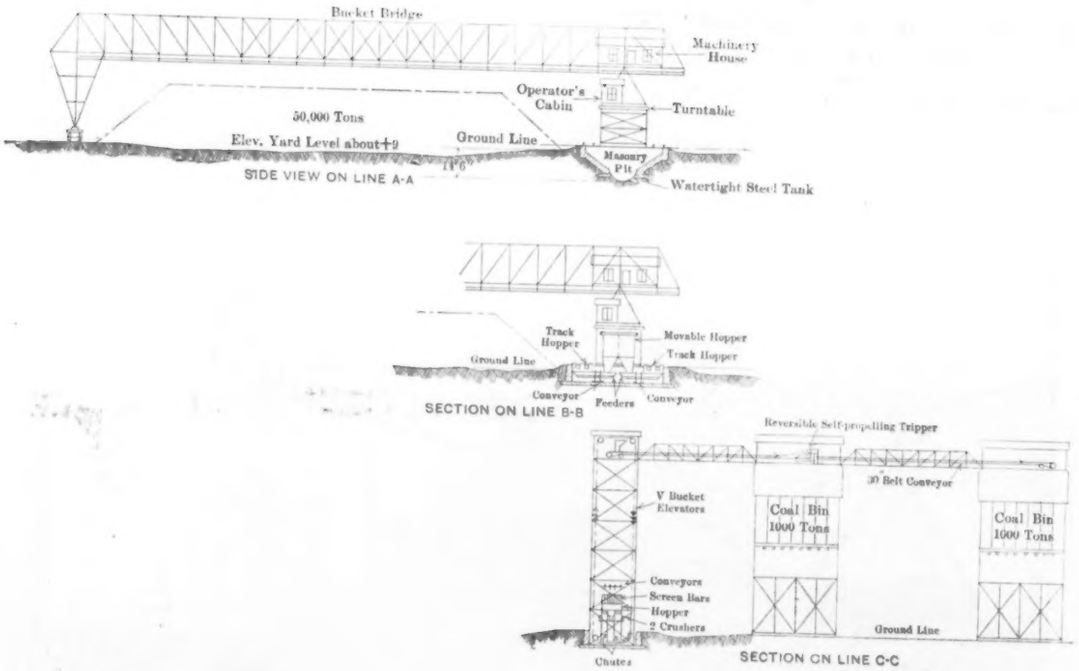
The Link-Belt Engineering Company of Philadelphia have recently installed at the works of the Maryland Steel Company, at Sparrows' Point, Md., a most interesting plant for the handling and storage of soft coal. The plant in question consists of one of their circular storage systems, having a capacity of 50,000 tons, and operating in conjunction with a crushing, elevating and conveying system handling 1600 tons of coal in 10 hours. The outfit has been in very successful operation for over two months.

The coal storage was made necessary by the completion of a 200-ton by-product plant, built from designs furnished by the United Coke & Gas Company of New York. The ovens are arranged in four batteries, as shown by the accompanying map, each set of two bat

Fig. 1.—General View of Coal Bins.—Center Tower of Pivotal Bridge Tramway is Shown at the Left.

Fig. 2.—One of the Four Steel Track Hoppers with Automatic Feeding Gate.

CIRCULAR STORAGE SYSTEM FOR 50,000 TONS OF COAL.



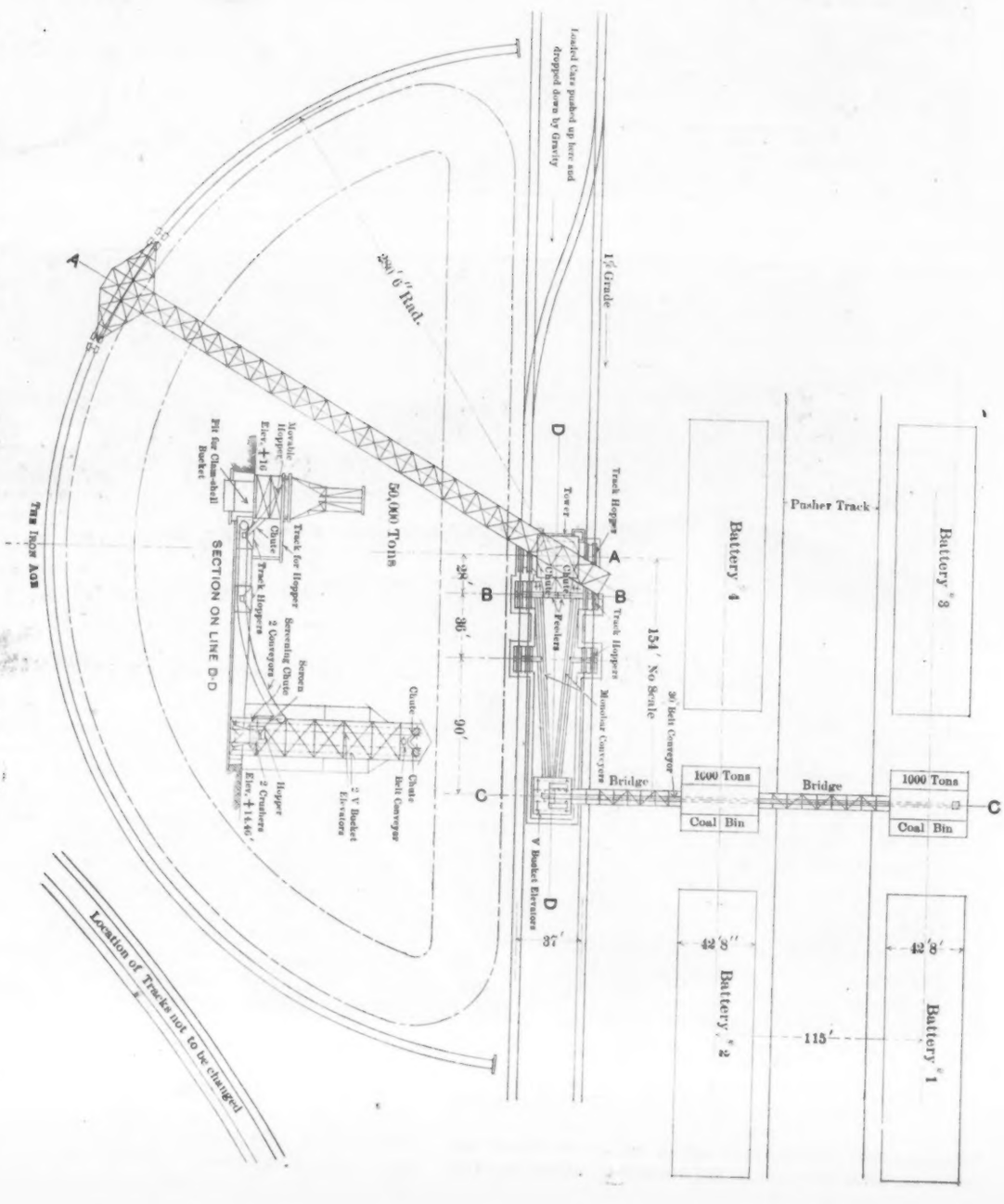


Fig. 3.—Plan Showing General Arrangement of the Plant.

CIRCULAR STORAGE SYSTEM FOR 50,000 TONS OF COAL.

teries being served by a coal bin holding 1000 tons. The ovens are capable of coking 8 tons of coal each 24 hours, so that 1600 tons of coal are required each day.

In deciding upon a suitable coal handling equipment the Maryland Steel Company submitted the following requirements:

1. That a storage of 50,000 tons of coal be provided for.

2. That the plant be capable of receiving coal from four cars simultaneously.

3. The plant to have a minimum capacity of handling, crushing, elevating and distributing into the two overhead bins 160 tons of run of mine bituminous coal per hour.

4. That the reduction in size of coal be from run of mine to 1 inch and under.

The plant adopted as meeting all of these requirements consists of one of the Dodge Coal Storage Company's circular systems of storing coal, employing a swinging 280-foot span, equipped with electrically operated hoisting mechanism, 2-ton clam shell bucket, moving gear and other appurtenances. The storage system is so arranged that it will receive coal simultaneously from two cars, and will distribute it by means of the automatic bucket to any part of the storage area. When reloading, the coal is taken from stock by the automatic bucket and delivered directly, through suitable chutes, to the conveying system.

The conveying system itself employs four steel track hoppers, Fig. 2, located on two tracks, which are 37 feet apart, the track hoppers being equipped with feeding gates which automatically deliver the coal in proper quantities to inclined scraper conveyors, Fig. 4, which in turn deliver to the crushers.

Before entering the crushers the coal is passed over bar screens, which remove all material that is smaller than 1 inch. The arrangement of screens and chutes from scraper conveyors to the crushers, shown in Figs. 5 and 6, is such that coal can be delivered from either conveyor into either crusher. The crushing rolls are two in number and of exceedingly massive construction; the rolls themselves are 46 inches in diameter, 36 inches wide, and are provided with fluted surfaces. The rolls are operated differentially, so as to give a grinding effect, and the product is passed from the rolls to elevators. Each scraper conveyor, each crusher and each elevator has a capacity of 160 tons per hour, so that in case of a breakdown on either side the required capacity can still be handled.

The bucket elevators are of the V-bucket type, with buckets 4 inches long, 24 inches wide and 12 inches deep, attached at intervals to heavy steel bushed steel link roller chains. The elevators are about 90 feet high and deliver overhead into a 30-inch belt conveyor, Fig. 8, which distributes the coal through a suitable self propelling tripper into the two coal bins.

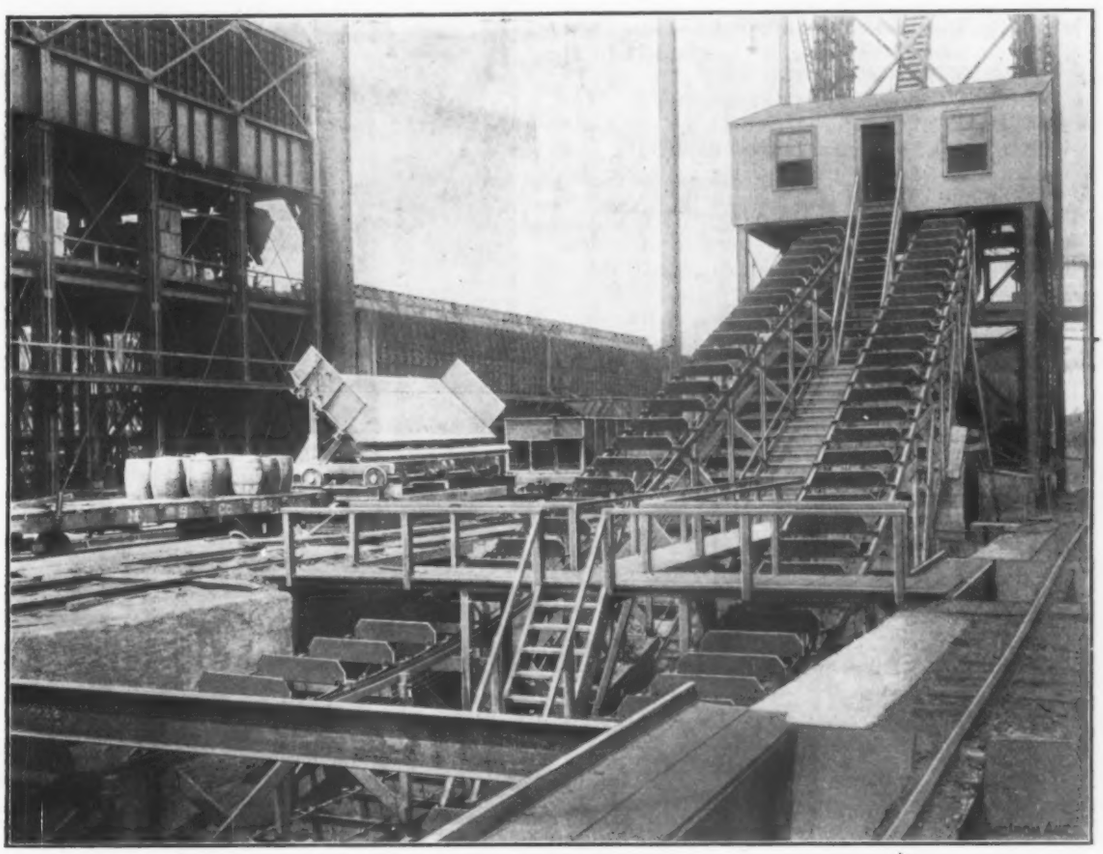


Fig. 4.—Double Strand Suspended Flight Conveyors which Receive Coal from Track Hoppers and Deliver to Crushers.

CIRCULAR STORAGE SYSTEM FOR 50,000 TONS OF COAL.

The belt conveyor is about 250 feet centers and has a capacity of about 320 tons per hour, so that it will receive all the coal that both elevators, operating simultaneously, can deliver to it. The belt conveyor employs a woven cotton belt, made especially for conveyor purposes, this belt having proved considerably more durable in practice than the standard types of rubber belt or the cotton layer belts. The troughing of the belt is exceedingly shallow, the purpose being to make the belt as flat as possible without sacrificing the capacity, and thus avoid the exceedingly rapid deterioration which the belt undergoes when deep troughing is resorted to. All of the machines are operated by independent direct current motors, wound for 250 volts.

During a test recently made while coal was being handled at the rate of 220 tons per hour, current readings, reduced to their equivalent horse-powers, gave the following results:

	Starting load.	Empty.	Loaded.
East conveyor	20	5.8	13
West conveyor	17	5.9	12
North reciprocating feeder	4.6	3.3	5.8
South reciprocating feeder	5	3.2	5

	Starting load.	Empty.	Loaded.
East crusher	43	7.7	12.7 to 17
West crusher	43	7.8	12.7 to 16
South elevator	26.3	8	17.7
North elevator	28	10	16.7
Belt conveyor	24.3	11	11.7

The total power with all machines in operation averaged, for full load, 117 horse-power. Including the trimmers in the railroad cars, the labor cost during the test was 8-10 cent per ton handled. Assuming 2 cents per horse-power hour, the power cost was 1.10 cents per ton, so that the total labor and power cost for taking 1 ton of run of mine bituminous coal from hopper bottom cars, conveying it and reducing it to 1-inch and under in size, elevating it vertically 90 feet and distributing it into the overhead bins, a distance of 200 feet, averaged 1.90 cents per ton.

The Cornell Dam.—Owing to the nature of some portions of the ground underneath the site of the new Croton dam, or the Cornell dam, as it is distinctively called, which is to supply New York with 32,000,000,000 gallons of water additionally, much anxiety has been caused as to the stability of the structure itself. It seems that the foundations were not carried down to a rock bottom in all cases; a large trench was dug 160 feet below the bed of the Croton River, and all the loose rock removed, but in another portion of the dam this plan was not followed absolutely, and it is now discovered that in some parts of it a loose friable limestone exists in pockets which threaten to give trouble in future. It so happens that these pockets are vertical, and at right angles to the axis of the dam itself, so it may be necessary to go down a long distance before the bed rock is reached; borings of 60 feet have been made without getting to the bottom of the pockets, and it is now deemed essential, upon the advice of eminent geologists, to carry horizontal borings through the pockets along the exposed parts of the site to ascertain exactly what the nature of the soil is. There is no difficulty in making the structure safe and secure for all time, but the revelations made will delay the completion of the dam for a considerable period.

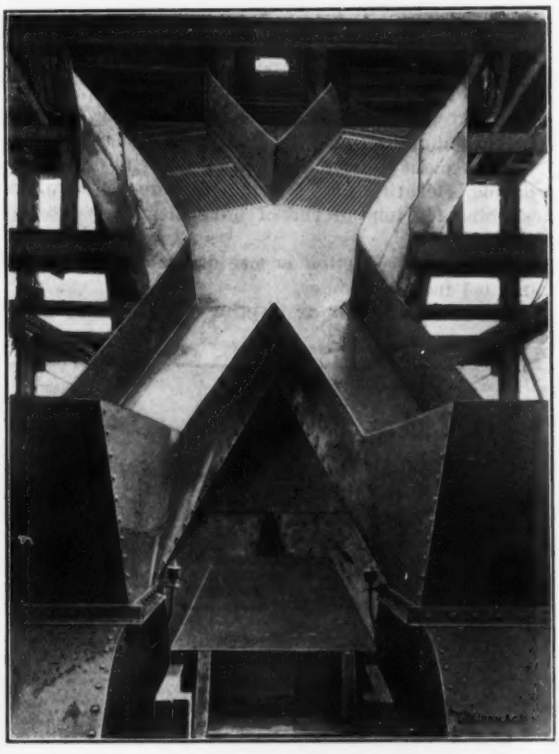


Fig. 6.—Screen Chutes which Receive Coal from Conveyors and Deliver to Crushers.

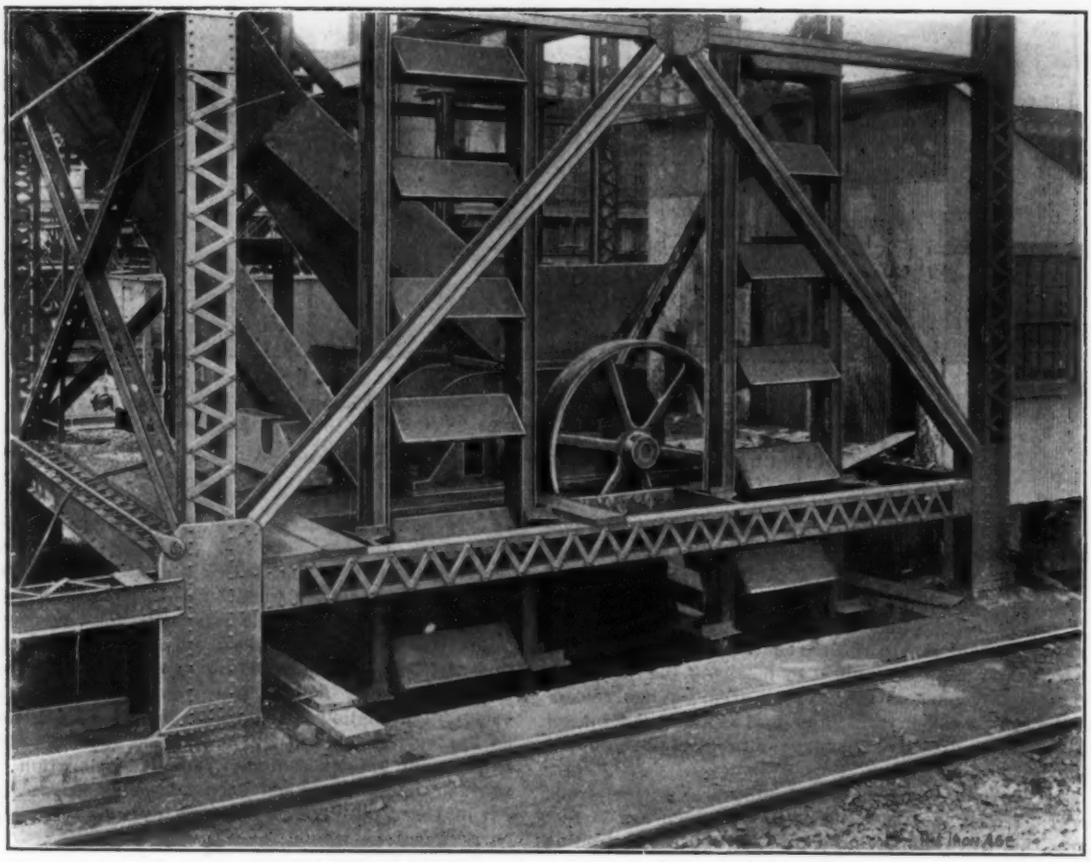


Fig. 5.—Crushers with Chutes from Conveyors and Vertical Elevators.

CIRCULAR STORAGE SYSTEM FOR 50,000 TONS OF COAL.

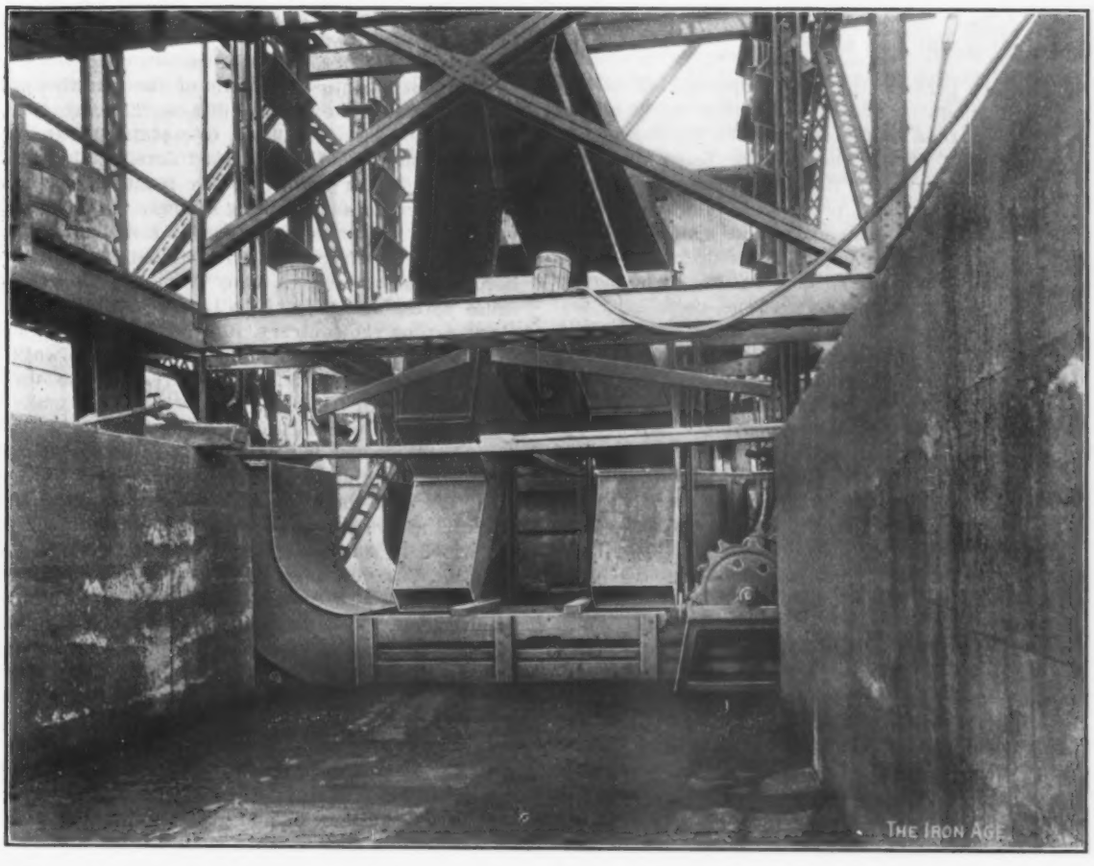


Fig. 7.—Lower Runs of Elevators, Showing Delivery Chutes from Crushers.

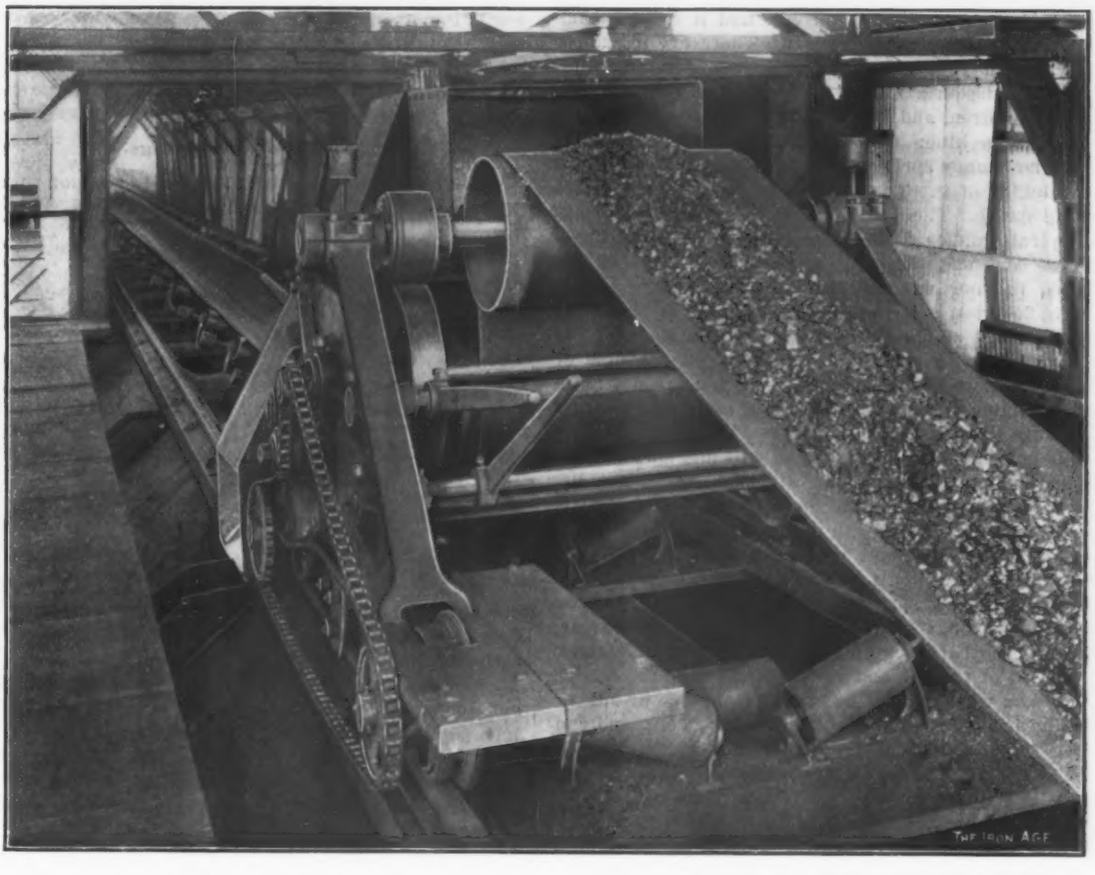


Fig. 8.—Scandinavia Belt Conveyor with Self Propelling Tripper, which Distributes Crushed Coal into the Two Coal Bins.

CIRCULAR STORAGE SYSTEM FOR 50,000 TONS OF COAL.

Springs and Their Use.

BY IVAR KIRKEGAARD.

Springs are perhaps the most important of all the various wire products, and although their early history dates back less than half a century the development of the spring trade during the last 20 years and even during the last decade is a distinct feature of the manufacturing world's colossal progress. America leads in steel making and wire drawing, and as a natural consequence the American spring manufacturers have long since distanced European spring concerns, who hardly deserve the name of competitors. True, there exist several spring factories in England, France, Belgium, Switzerland, Germany, Sweden and Norway, but the majority are of minor importance, and as a general rule confine themselves to one or two special branches, such as clock springs, furniture springs or leaf springs. All springs used in exported American machinery are manufactured here, as are also the springs for renewal. But factories for making all kinds of springs, from a car spring, made from 1½-inch stock, to a No. 36 music wire spiral spring, are found only in America.

It is very evident to the intelligent observer that there is still a steadily growing demand for springs all through the civilized world.

Look around in your own modern home and see to what a large extent you yourselves are using these articles. You open your door and the door closes itself; a hinge spring does that for you. You want to leave your door half open, and by a pressure of your foot on your door-stop your door will stay wherever you want it to stay; a door-stop spring does it. You sit in a common arm chair; there are edge springs in the seat, arm springs in the arms, pillow springs in the back. Sit in your American rocking chair or your office chair; a spring makes it easy for you to rock or to lay back or swing around without the slightest exertion. Your curtains are rolled down and you feel like letting in the sun. By touching the curtain it rolls up; a curtain spring does it. Go to your telephone and you will find it full of small springs if you ever take it apart. There are a number of springs in your piano. The mantle over your gas burner is hung on a mantle spring wire. You buy toys for your children, and in almost all toys you will find a spring of some kind. Go out in your kitchen and pantry and see how many springs you are using without perhaps ever thinking of it. The best carpet beater is a twisted wire jig spring. The best ice tongs are coiled jig springs with spiral handles. The stove handles are most likely made of cone shaped spiral springs. Your screens are fastened in your windows by screen springs, &c., and when at last you get tired of figuring how much money you have spent on springs without knowing it, you go to bed and lay down on a fabric hanging on a couple of hundred or more helical springs, or if you are not quite as up to date as that, on a gross or more of furniture bed springs.

It is not only in your house you will find springs, and they are not only luxuries but oftentimes necessities.

Your governor spring in the engine is a necessity. Take a modern train and you not only find springs in the seats but large hot-wound spiral springs under the cars and in the brakes; you find brake springs, brake release springs, graduating springs, &c. In an electric car you find trolley springs on top of the roof, under the car, springs in the batteries and springs in the car heaters. Go in front of the car and you will find that the fender is made of a whole row of jig springs, laid side by side.

Go out in the field and see the farmer at work, and you will see that all agricultural machines can be worked only by springs. You find such springs as rake teeth, hay kickers, trip tooth cultivators, wire grain tubes and hundreds of other devices of similar kinds, also a very large amount of extension and compression springs. In almost all automatic machinery you will find one or several machine springs. You will find springs in looms, shuttles, &c.

I have mentioned only a very small number of springs used, but you have now seen the practicability of using springs for extension and compression; for stopping a weight from falling—not abruptly but gradually; for lifting a weight to a given position, and to automatically expand or contract all sorts of mechanical devices.

I cannot go into the details of the manufacturing of springs, because the working of a machine, whether automatic or not, is very difficult to explain unless you have the machine in front of you, but I dare say that it is very difficult to find a branch of any manufacturing that is more interesting than making springs. I find that people who have worked as draftsmen, foremen or superintendents get so fascinated with it that they find it very hard to tear themselves away from it. This is not because spring manufacturing is one continual round of pleasure; on the contrary, it is because there is nothing monotonous in the manufacturing. There is always something new—something that requires you to use your very best mental faculties.

You cannot use the same machinery year after year. The machine which is ahead of any other spring machine to-day may be out of date in a month, and you have to get in line with the rest, and if possible be ahead of them. There is at present a competition in spring manufacturing which is continually growing with the demand for springs. The customers who have been buying springs for years are also continually increasing their specified requirements. They may not only ask for new dimensions of their springs, which would be an easy task for the manufacturers, but they will ask for greater elasticity, greater movement or greater stiffness or exactness in every respect.

Agricultural firms who for years used a common close wound extension spring, with hooks on each end, which then were never tested but simply made with the same old diameter, same size and grade of wire, &c., are now requiring that such springs shall lift or pull an exact number of pounds, or which will compress or extend to a specified fractional part of an inch. Such requirements necessitate a fine scale test, which costs money and time, and this is only an instance of thousands.

Springs may be divided into five principal classes:

1. Furniture springs.
2. Spiral springs.
3. Hot wound springs.
4. Jig springs.
5. Flat wire springs.

1. Furniture Springs.

There are two essentially different styles of furniture springs—*i.e.*, full springs and half springs.

Fig. 1.—Typical Knotted Full Spring.

Fig. 2.—Full Spring.—Plain End Lounge Spring.

Full Springs

are used for upholstery work, lounges, beds, &c. They may have knotted or plain ends, depending upon what style the upholsterers want for their webbing or cords. They are as a general rule japanned, sometimes coppered, but copper is more and more going out of the market for such goods. Full springs, whether plain or knotted, have certain market numbers, which run from No. 0 to No. 7—the numbers running from No. 1 to No. 5 being the most common. It is the number of coils which determines the style number.

Number 0 contains 5 coils.	Number 4 contains 9 coils.
Number 1 contains 6 coils.	Number 5 contains 10 coils.
Number 2 contains 7 coils.	Number 6 contains 11 coils.
Number 3 contains 8 coils.	Number 7 contains 12 coils.

The hights vary from 4 to 16 inches. The centers run from 1⅝ to 3 inches; the top and base run from 4 to 5½

inches; wires from No. 8 to No. 11, American Steel & Wire Company's gauge.

Full springs are made of furniture spring wire, cheaper or better grades according to what the customer wants and according to the price he wants to pay. They may be rolled by hand on wooden blocks or coiled automatically on full spring machinery. After they are rolled they are set, and after they are set they are blued (tempered) or stiffened in oven with a heat of about 450 to 500 degrees, in from 15 to 20 minutes.

Edge Springs, No. 10 Wire.—The edge spring is a special full spring, with one end square or nearly so. These springs are generally used in Turkish chairs, the square ends being turned toward the frame of the chair. The purpose of these special springs is to save excelsior and upholstery labor. These springs are generally made on hand blocks.

Lounge Springs, Nos. 9½ and 10 Wire.—The lounge spring is a sort of a half spring, tapering, with a full spring end down and terminating in a large coil which makes it a special full spring. As the name indicates, it is generally used in lounges. A lounge spring made of finer wire, such as No. 14 and 15 wire, and smaller in dimensions than the regular lounge springs, is called "arm spring." They may be used in the arms of an easy chair or the backs of parlor sofas, &c. Another special lounge spring is the so-called Duplex, which has an eye in the center of the smaller end.

Car Seats.—Car seats are used in children's beds (cribs), chair seats, &c. They are small full springs, running in hight from 3½ to 5 inches, with more coils on an average than the regular full springs. The coils in a car seat spring run from 5 to 7.

Pilgrim Springs.—Pilgrim springs are used in flat, iron bed frames, fastened by jack chain and clips. They are made of light wire, generally 11½ or 12, and have a medium center, say about 2-inch, and about 5-inch base and top.

Crown Springs.—Crown springs are very special springs with four close coils in the center and both halves perfectly alike. Very few are used, and they are used in special car seats.

Jingles.—Jingles are used for bed springs. The right angular bends are fastened in holes punched in the flat wire strips of which the bed frame is composed. They are generally made of No. 11 wire, and are sold japanned, coppered or tinned.

Half Springs

are cone shaped furniture springs with plain or knotted ends. Seventy-five per cent. of all half springs made have knotted ends. Here are some of the best known styles:

Fig. 3.—Typical Half Spring (King High Top).

King High Tops.—King high tops are used in beds. The small eye is riveted to flat pieces of steel, of which the bed frame is composed. The tops are fastened together with jack chain or wire clips. They are the most common style of half springs, and are generally made of No. 10½ or 11 wire, and run from 6½ to 8 inches in hight—top generally 5 inches.

Lads.—Lads are used in so-called cabinet beds, in Pullman cars, for instance, and also for street car seats. They are made in many different sizes and of from Nos. 10 to 15 wire. The heavier sizes, Nos. 10 and 11, have a flat top, while the finer sizes, Nos. 12, 13 and 14 wire, have a high top and terminate in a spur which must be at right angles and exactly opposite to the bend of the eye. The spur is ¼ inch long and is driven into wood.

Plain Dowels.—Plain dowels are used in very cheap beds with wooden framework. The spur is called the dowel point and is driven into wood and fastened more securely with staples. Over the top are laid wooden slats at the same hight as the bed, and the whole article can be bought very cheap. Now these styles are practically out of the market. The knotted dowel is a more common style at the present time than the plain dowel. Dowels are made of from Nos. 9 to 12 wire.

Solid Comforts.—These are fine wire dowels, and run from Nos. 12½ to 14 wire. Some of these have a so-called "Nelson knot." A hook is made on the end of the wire, the bottom coil is fastened to a form and the eye is formed over the hook by turning the body of the spring out over the hook and back into position. The knot is made on fine wire springs only, and this style is preferred for the ordinary knot, which slips a good deal easier than the Nelson knot.

Chair Springs.—Chair springs have a plain bottom, which is interwoven with corrugated wires fastened on wooden frames. The tops are either plain or knotted and are fastened with cord. They are one of the fastest selling styles, and are used in chairs, lounges and sofas. Almost all sizes of furniture spring wire are used, and they are made of largely varied dimensions.

Dunks.—Dunks are dowels with the spur bent toward the top of the spring. The spurs are inserted through small holes in flat strips of steel, which makes an unusually good fastening and one of the strongest beds in the market. Dunks are made generally of Nos. 8 and 9 wire, and terminate with a spur similar to the one on a lad. This spur is driven into wood. Dunks are generally made on wooden blocks.

Fig. 4.—Twin Bed Spring.

Twin Springs.—Twin springs are two dowels or king high tops or chair springs made of one piece of wire. By doing this the use of jack chain or cord for fastening the tops is made unnecessary.

The wider the center of full springs is the least resistance the spring will give to compression; the narrower the center the stiffer the spring. The best results are obtained when there is just room enough for one coil to go inside or outside the other. The nearer the coils lie to each other when the spring is compressed the more force has been used in compressing the spring. The more distance between the coils—in other words, the bigger the pitch—the stiffer the spring.

All furniture springs are rolled (coiled) a good deal longer than the required length. After the coiling they are compressed solid, and the compression in most cases greatly reduces the length. As an instance of how a spring will set after the compression, let a lounge spring 8 inches long be taken. It will measure about 11½ inches when taken from the block, and will set to 8 inches if it is compressed immediately after. If the spring is blued after the rolling it will not set as much, so in that case the springs would have to be wound a good deal shorter, say about 9½ inches.

The smaller the inside diameter of the coil the more the springs will set. The wider the coils the less the springs will set, and full springs with very wide centers will set very little in the compression. The more coils the less the spring sets.

To sum this up: the heavier the wire and the smaller the coils the more pitch is required before setting and the stiffer the spring is when finished. The smaller the wire and the wider the coils the less pitch is required before setting and the softer is the spring when finished.

2. Spiral Springs.

Spiral springs are made of tempered or untempered spring wire. Heavy spiral springs which are rolled hot are generally called hot wound springs, and we will come back to them later. The springs called spiral springs are wound cold and may be made of almost any size wire and of any dimensions, and in order to give an idea of how they will vary I will mention that I know of a factory starting about 13 years ago numbering its first spiral spring No. 1, the second No. 2, &c., which is now near the 30,000 mark, and only a very few of these 30,000 springs are exactly alike in size, pitch, stock, finish, etc. The heaviest size wire coiled cold is about ½ inch, and there are spiral springs coiled of wire as fine as No. 37 music wire.

Various finishes are used, such as coppered, liquor or bright finish, and a very large amount of spiral springs are japanned either black or maroon.

Most heavy, close wound spiral springs, also about 35 per cent. of open wound spiral springs, are made of oil tempered wire. In oil tempering wire several bundles are run through a heating furnace thence to oil troughs, and from oil to molten lead. From the lead kettles it is cooled off in water, pulled by draw out rolls and bundled on take up reels as finished oil tempered wire. Twenty years ago spiral springs were generally made and finished of soft spring wire, then heated and hardened in oil. The saving accomplished by tempering the wire first instead of finishing the springs and then tempering them is easily understood.

Spiral springs can be divided into two principal classes—compression and extension springs.

COMPRESSION SPRINGS.

Compression springs are open wound in long lengths, blued, tested and cut in shorter lengths, according to

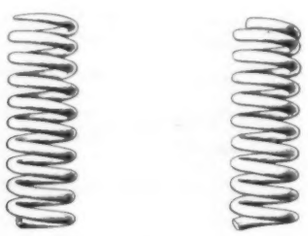


Fig. 5.—Typical Compression Springs.

customers' demands. If a compression spring must stand perfectly straight when finished the spring is squared and ground after being cut to the required length. These springs may be coiled or wound on a revolving arbor fastened to a special chuck in a lathe head. The pitch is obtained by using a hand guide. Other methods of coiling spiral springs are: Machines for feed rolls, which force the wire around a stationary arbor and against a guide slanting in such a manner that the necessary pitch is obtained, or on so-called quill and arbor machines, where the wire is forced by two feed rolls around a little grooved arbor fastened in a quill. There are also automatic machines which coil and cut springs in short lengths in one operation.

After the long lengths of open wound springs are wound the long lengths are compressed, or tested, as it is called, in testing machines—that is, the coils are pressed together solid three or four times. This takes the set out of the springs, so that after the springs are cut up in required lengths they may be set, say ten times a minute, and they will still come back to the original hight or length. About 90 per cent. of compression springs are blued either before or after testing—most of them before testing. Bluing or tempering gives the long lengths a greater elasticity, and makes them so stiff that they do not set so much in the testing. In other words, after the cutting, springs are obtained with less wire and more movement, which generally is what the customers require. On the other hand, if the necessary pitch is obtained by testing the coils without first bluing them, it is better to test first and blue afterward.

The flattening of the end coils is called "squaring." This is done by heating the end coils and closing them together either by pinchers or simply by compressing the spring. Sometimes squaring alone is sufficient to make the springs stand up fairly straight, but if it is not sufficient the end coils are ground smooth on an emery wheel.

In some ways the working of spiral compression springs is similar to that of furniture springs. The smaller the diameter and the more pitch the stiffer the spring. The larger the diameter and the more coils the weaker the spring. If a stiff spring with a small diameter is required it is necessary to give the springs about twice the required pitch in winding. Sometimes springs are made with so large a diameter and so small a pitch that testing or compressing is not necessary. In other words, they will not set after the winding. If a spring is wound on a ½-inch arbor, for instance, it will not result in a spring with ½-inch inside diameter; it will open up more or less, all depending upon the size of the wire, the stock and the size of the arbor. If a piece of ¼-inch spring wire be wound around itself it may not open up at all. The diameter is in that case so small that it takes most of the life out of the stock and prevents it from opening up. On the other hand, if a ¼-inch wire be wound on a ½-inch arbor a spring will be obtained with about 9-16-inch inside diameter.

There are compression springs which work on a pin and in a hole, so that the manufacturer is limited both on inside diameter and outside diameter and on the size of wire, although a slight variation in the diameter should always be allowed. A bundle of, say, No. 17 oil tempered wire may be coiled on an arbor, and the diameter of the coil will be found to vary as much as 1-64 inch, although the coil is made of the same bundle and on the same arbor. This is on account of the composition and treatment of the stock. If a part of the wire is a little soft the diameter will be smaller. If there is a place in the bundle where the stock is a little harder than the rest the coil will open up a little more. In either case the coil will be spoiled, and for such springs only first-class spring wire can be used.

It may be of interest to know how such springs and other similar springs are ordered by customers. Sometimes they send a sample, which is supposed to be correct, and in such cases all the manufacturer has to do is to make the springs like sample; or they may send a blue print, which is just as good and sometimes better than the sample, or again they may send only the dimensions, giving the inside or outside diameter, number of coils per inch, or the total number of coils, squared or ground or plain ends, length, &c. As springs are always sold by the pound or by the thousand (except furniture springs, which are sold by the dozen or gross) it is necessary to know the weight of the springs per thousand before making them in order to fix prices, &c. The weight of spiral springs is very easily figured if the outside or inside diameter, the number of coils and the size wire are given.

When the outside diameter is given subtract the size of the wire from the outside diameter, getting the main diameter, or when the inside diameter is given add the size wire; multiply the main diameter by 3.146, obtaining the main circumference; multiply the main circumference by the number of coils, getting total length of wire in spring. Take the weight per foot of wire, and divide by 12, which gives the weight per inch. Then multiply by the number of inches of spring and get the weight per thousand.

I will give an example: Say that the spring is ½ inch inside diameter, ¼-inch wire and 10 coils. Add the size of wire to the inside diameter, which gives 0.750; multiply by 3.146, and the result is 2.359 inches. This gives the length of wire contained in one coil. Now there were ten coils in the spring; multiply by 10, and the result is 2 feet, which is the length wire contained in the spring. Now by consulting the wire table for ¼-inch wire it will be found that it weighs 0.1656 pound per foot. This spring contained 2 feet of wire, consequently it weighs 0.3312 pound, or 331.2 pounds per thousand springs.

Some of the most important styles of compression

springs are screen springs, brake springs, air gun and toy gun springs, shuttle springs and small wagon springs.

EXTENSION SPRINGS.

Some of the principal close wound or extension springs are trolley springs, door springs, helical or bed springs, scale springs and springs for agricultural machinery.

Fig. 6.—Typical Extension Spring.

Fig. 7.—Door Spring.—One End.

Fig. 8.—Helical Spring.

Close wound springs are wound in long lengths like the compression springs, cut to lengths and sometimes hooked. Sometimes the ends are cone shaped, coned over swiveled hooks, all depending upon the shape of the device in which they are working. Close wound springs are tested by extension, but only when tests are called for. If a customer wants an extension spring to open up 4 inches at 400 pounds extension, the manufacturer has to put the springs through fine testing machines in order to obtain the very best results; but if delicate tests are not asked for it is too expensive to scale test extension springs.

Often the customers do not know the dimensions required, and ask for a spring to stand a certain extension at a certain strain, and leave it to the manufacturer to find the size wire, and most all of the dimensions with the exception of length.

The closer an extension spring is wound the stiffer it is and the more of a pull is required to open it. If an extension spring is wanted to extend twice its length a loose wound spring is required. The looser a close wound spring is wound the less pull is required to open it, but the longer it will extend without stretching.

Fig. 9.—Typical Hot Wound Spring (Buffer Spring).

3. Hot Wound Springs.

Hot wound springs are made of spring rods of sizes varying from ½ to 1½ inches. They are used as extension and compression springs, like the cold rolled spiral springs, but only a very small percentage of the hot wound springs are extension springs, the open wound compression spring with squared ends being the most common style. Their principal uses are for car springs. They are used under electric cars, freight cars, parlor cars, &c. Hot wound springs made of square wire we find as governor springs in engines and steam gauges, &c.

Under most freight cars there are four nests of hot wound springs, each nest containing either four or eight springs; if eight there is a heavy outside and a smaller inside spring. If the buffer at the end of the car there are as a general rule two springs, one inside of the other, the inside longer than the outside spring. This is to take off the jar when the cars come together.

Hot wound springs are usually made in the following manner: First the exact length of steel contained in the springs is figured; the rods are cut in straight and exact lengths; the ends are heated, are tapered in a tapering machine, and then these cut lengths are heated and coiled. As soon as the springs are coiled, while still hot, they are thrown into fish oil, where they remain until perfectly cold. After this hardening process the temper is drawn in ovens with a heat of about 600 to 700 degrees. They are kept in these ovens from 15 to 20 minutes until the fish oil is burnt off and the springs have a bluish or grayish appearance. After the bluing the springs are compressed solid several times to take off the set.

Like furniture springs and spiral springs, hot wound springs are given a good deal more pitch in the winding than what is required for the finished length, so that the spring is a good deal longer before the compression than after.

Fig. 10.—Bicycle Seat Spring.

Fig. 11.—Flat Wire Spring (Car Fender).

4 and 5. Jig Springs and Flat Wire Springs.

Most special shaped springs are commonly called jig springs. There is such a variety that jig springs could be divided into hundreds of classes according to the use they are put to. One of the features in manufacturing them is the jigs—*i.e.*, special hand tools which are used in the bending of the wires—and the lathe heads with stop motion, and special arbors. Other features about making jig springs are automatic machines with four or more slides.

Fig. 12.—Hay Kicker.

Fig. 13.—Hay Loader.

Fig. 14.—Tedder Fork (One Part).

Fig. 15.—Tedder Fork.

Fig. 16.—Baby Carriage Spring.

A few well-known styles of jig springs are bicycle saddle springs, rake teeth, hay kickers and loaders, tedder forks, car fenders, baby carriage springs and hundreds of other bent, crimped or pointed wires. It is in the jig spring department that a spring manufacturer has especially good use for men with mechanical ingenuity, and a well assorted department of this kind is a most interesting study for a mechanical engineer or draftsman. There are used straightening and cutting machines for cutting wire to exact lengths, power and hand jigs of all descriptions, presses with dies of numerous designs, milling, drilling and pointing machines, automatic wire forming machines, &c. There are good machines of this class in the market, but almost all spring manufacturers who buy them are continually changing and improving

them so as to economize on handling and to be able to take care of all the new shapes and styles of bent or coiled jig springs for which there is a continual demand.

Spring Stock.

The best spring wire is drawn from open hearth acid stock with a carbon varying from 0.45 to 0.75. Hot wound springs are made from open hearth acid (or basic) rods, carbons from about 0.75 to 1.20, and the most up to date and economical factories for hot wound springs are such as are connected with a rod mill, so that considerable fuel can be saved in the first heat by utilizing the rods before they lose the heat from the rod mill furnaces.

Furniture spring wire must stand a test of a right angular bend and a bend around itself (knotting) without breaking. It must furthermore possess stiffness and elasticity. Almost all untempered spiral and jig springs are made of furniture spring wire, and must possess the same qualities as mentioned above.

Bluing and Japanning Springs.

Bluing or "tempering" is done generally after the springs are formed, coiled or bent into the required shapes in order to increase their stiffness and staying ability. The best but also the most costly bluing is done by a molten lead dip, because lead can be kept at a uniform heat and gives the most even temper. Ordinarily several hundreds pounds of springs are blued at one time in large bluing ovens, heated by liquid fuel or gas, and the bluing is denoted by color and test. The heat of the ovens is about 700 degrees for jig, spiral and hot wound springs, and it takes from 20 minutes to half an hour to effect a sufficient bluing. Bluing close wound springs weakens them; bluing open wound springs stiffens them.

The solution called japan is bought in casks of 50 gallons each, and is composed of asphalt and tar boiled with linseed oil. Before the japan is used it is mixed with turpentine, naphtha and raw linseed oil (or naphtha only), and is kept at a lukewarm temperature. The point is to get a japan that does not make a very heavy coat and is flexible and will not crack when the wire is bent. For close wound springs the japan must always be a great deal thinner than for open wound springs, so that it will run or drip from the springs and not leave any thick spots. The springs must be perfectly clean and free from grease before dipping.

The ovens should be heated to about 300 degrees F., and the springs will be baked and ready to take out in from one and a half to two hours.

The fire should be run low at first when the car is put into the oven, and be increased gradually the first ten minutes until a temperature of 300 degrees has been reached.

Wyman & Gordon in Cleveland.

Wyman & Gordon, manufacturers of drop forgings at Worcester, Mass., are to establish a plant at Cleveland, Ohio. They have bought a tract of land with 500 feet frontage on the tracks of the Cleveland & Pittsburgh Railroad, and bounded on the other side by Superior and Wason streets. The property contains at one end a shop building erected for the manufacture of cranes, but abandoned several years ago for that purpose and now used as a storehouse by a machinery dealer. This building will be continued under lease for the present, the intention being to ultimately remove it to make room for an extension of the drop forging shop building, which will be erected immediately. The other end of the property is occupied by residential buildings and similar structures, which will be removed as fast as the space is needed. In the center of the lot, on the railroad front, will be erected a drop forging shop sufficiently large for present needs, and back of that building, on the street, will be a new machine shop. The forge shop will be extended in the future in either direction and the machine shop in one direction, the shape of the lot being triangular and restricting the extension of the machine shop in the other direction. The Worcester plant employs about 150 hands, and it is expected that the plant at Cleveland will be as large within two years, the company planning to do their growing in the future at their Western works. Wyman & Gordon began business on a very small scale 20 years ago, and their growth has been unusually rapid.

The Bloomington Movement Against Union Intolerance.

We have made reference at some length to the action taken early this year by the citizens of Bloomington, Ill., to free their city from the exactions of labor unions which had grown intolerable. The movement has of course encountered bitter hostility from the unions and they have resorted to every means to weaken the force of the Citizens' Alliance, as the organization of employers and citizens has been named. Last week the alliance found it desirable to issue an address to the unions setting forth the position of the employers. It is couched in temperate language, but no uncertain tone is manifested. It is an admirable address and its sentiments appeal to every lover of fair play among all classes of men. We reproduce it in part herewith:

We have none but the friendliest feeling for labor unions and union wage earners. We recognize it as one of the noblest duties of American citizenship to educate, uplift and dignify wage earners, and for the accomplishment of this end we sincerely believe that liberal compensation for their labor, having due regard for the rights and just interest of other citizens, is the only sure means.

We fully believe that the conditions ought to be such that wage earners would be required to labor only during reasonable hours out of each 24, and that their compensation should be sufficient for their own support and for that of those dependent upon them in comfort, and in addition sufficient for them to accumulate a competence for the time which must come to all, when "no man can work." Under such conditions the lot of the wage earners would be equal to that of all other citizens, giving them equally with all others the opportunity to employ those twin virtues, energy and fidelity, to rise from the ranks of the wage earners to that of employers of wage earners. These conditions and this opportunity should satisfy the ambition of any man, wage earner, farmer, or son of millionaire. Within their legitimate functions and as long as they respect the rights of the people, we are the stanch friends of the labor unions and union wage earners, and will use all our energies as men and as an organization to defend them. But we do not concede their right to make laws, rules or regulations for the government of the people outside of their membership and outside of their assembly rooms. We and you elect a Congress, a Legislature and a City Council to enact laws, rules and regulations to govern the conduct of all the people alike, and to those laws, regulations and rules of conduct we yield a willing obedience and are determined that unions and union wage earners, as an important part of the great citizenship of our common country, shall do the same.

We do not concede your right to impose your self made laws, rules and regulations upon the people or upon your own members outside of your assembly rooms, by fines, ridicule, intimidation, picketing, the boycott, the sympathetic strike, or brutal force, and are unalterably determined that your attempted assumption of the power to so enforce them shall come to naught.

We do not concede your right nor that it is good public policy to allow you to build up a monopoly of labor in this free country by placing a limit upon the number of boys whom you will permit to learn a trade, or to enforce a union made law that only union wage earners shall be permitted to "earn their bread by the sweat of their brow" and thus provide for themselves, their families and their old age. Such a monopoly and such a union enacted law are as hateful to our free institutions as trust and capitalistic monopolies.

We do now and shall for all time stand for the right of every boy to keep out of the reform schools, the jails and penitentiaries by learning an honest trade, and after he learns it, to work at it whenever and wherever he can find work, without fear of any laws, rules or regulations save those enacted by Congress, the Legislature or City Council, and without fear of any class of men save those

intrusted with the enforcement of the constitutional laws which must control both you and us.

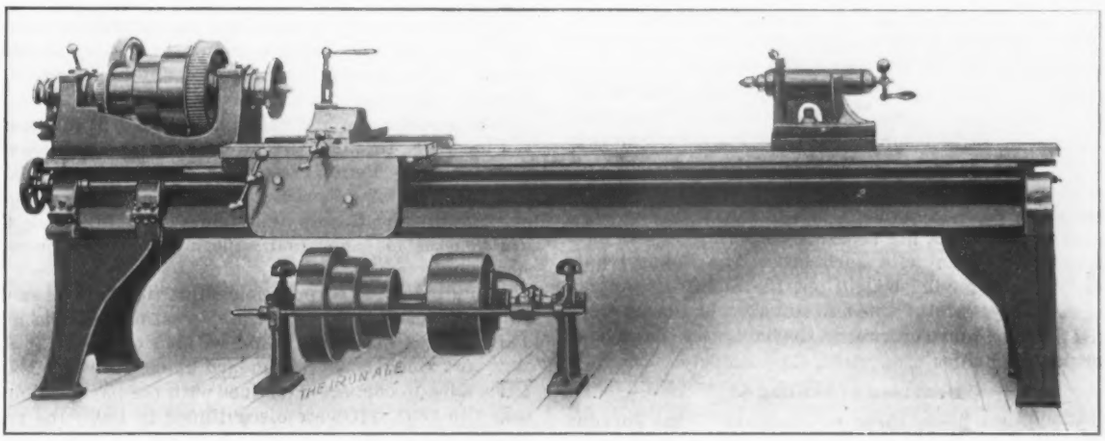
The conduct of your walking delegates and agitators and of many of the demagogues who more or less control your councils compelled the organization of this alliance. Under their leadership your usurpations, your tyranny, violence and contempt of the law and courts compelled the employers, the farmers, the merchants anl all the people outside of your unions to form this defensive organization for the protection of their most ordinary rights of citizenship, and you make a grave mistake if you imagine that the American people will yield up those rights to the despotic usurpations of your irresponsible leaders, or to you, or to any other class of men.

Nineteen workmen employed by the Eastern Bridge & Structural Company of Worcester, Mass., asked for their time Thursday of last week, their grievance being that four discharged employees were not taken back by the company when a committee demanded it. Thirty-five workmen declined to take part in the trouble and remained at work. The strikers represent various classes of men employed in the company's shops. They claim that the four men discharged were discriminated against because of their connection with the National Association of Structural Bridge Workers, but the officers of the company state that they were discharged after warning because of the quality of their work. The company have men to take the places of the strikers.

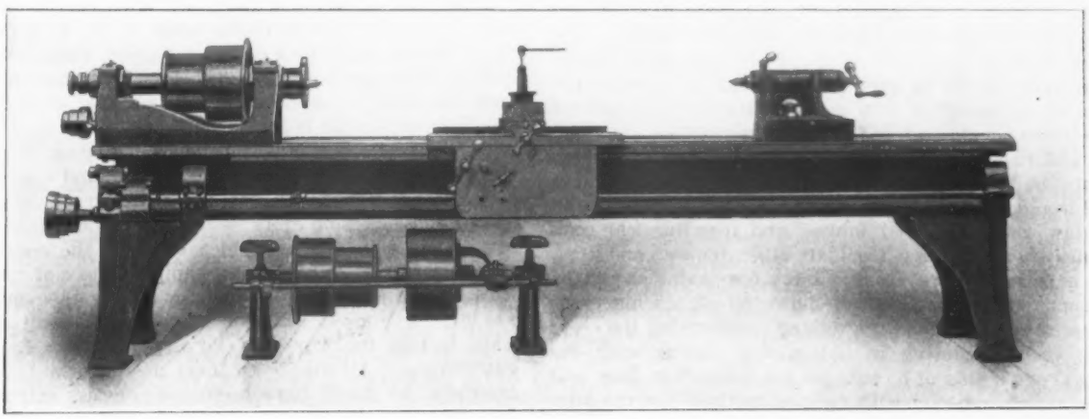
The Riter-Conley Technical Society, composed of employes of the Riter-Conley Manufacturing Company, of Pittsburgh, held their annual banquet at the Monongahela Club, Pittsburgh, on Monday, June 1. Thomas B. Riter, W. C. Coffin and John S. Craig, all connected with the Riter-Conley Manufacturing Company, made addresses.

The New Blaisdell Lathes.

P. Blaisdell & Co. of Worcester, Mass., have built four pairs of special lathes, shown in the accompanying illustrations, for work demanding power more than swing. Their purpose is to turn rolls and they are built to run in pairs. The particular lathes shown have flat top bed, without V's, an unusual feature in so large a tool. They swing 20 inches over the bed with 10 feet between centers. The carriage is gibbed on in front and rear and in the center. The back geared roughing lathe has a three-section cone, from 15½ down to 9 inches diameter, for 4½-inch belt, the ratio of gearing being 12 to 1. The gearing is extra wide to stand a heavy strain. The roughing lathe has screw feed only. The special finishing lathe has no back gearing, but has a large two-section cone for 6-inch belt. The machine has combination rod and gear feed only with six changes of feed. In each lathe the weight of the roll is supported in special housings, one at each end of the lathe, the lathe spindles being used for driving purposes only. These machines are made for very heavy work with the self hardening steel tools. The rack and pinion gears are of steel, the boxes of phosphor bronze, and the spindles, feed screws and studs are of crucible steel. While these two machines are special the company are manufacturing a regular line of similar lathes of 20 and 22 inch swing for rolling mills, railway shops and similar lines of work. The flat tops of the two machines shown were considered superior for the special purpose for which the lathes are to be used and were so ordered. In the regular line any style of rest is furnished. The weight of this lathe is 4000 pounds.



Back Geared Roughing Lathe.



Finishing Lathe.

THE NEW BLAISDELL LATHES.

Acetylene is being used successfully as a substitute for hydrogen in an oxyacetylene blow pipe. It is being introduced by the Compagnie Universelle d'Acetylene of Paris.

Iron Ore Deposits of Cuba.

Special Report on Occurrence and Production.

WASHINGTON, D. C., June 2, 1903.—The War Department has received a report on the iron ore deposits of Cuba, prepared by direction of Governor-General Wood under the immediate supervision of Dr. David T. Day of the United States Geological Survey. This report is one of a series designed to show the condition of the various natural resources of the island at the time of the surrender of the Government by the United States military authorities. While the greater portion of the report is devoted to the iron ore properties in the vicinity of Santiago, the developments in other provinces are also described in some detail. Following is an advance abstract of this report:

The most important mineral product of Cuba is iron ore. The production for the year 1901 was 555,177 long tons, valued at $1,240,555, and while the detailed figures for 1902 are not yet available it is understood the output was somewhat greater than in 1901. This output was the production of three companies in the Province Santiago de Cuba: The Spanish-American Iron Company, the Juragua Iron Company and the Cuban Steel Ore Company. These three companies, with headquarters in the town of Santiago de Cuba, are separate corporations, but have intimate connection with each other, the Pennsylvania Steel Company having bought out the Spanish-American Iron Company, owning one-half interest in the Juragua Iron Company and controlling the policy of the Cuban Steel Ore Company.

Province of Santiago.

The oldest of these three organizations is the Juragua Iron Company, who shipped their first cargo of ore in 1884. The first iron claim in Cuba was located in 1861, but it was not until 1883 that foreign capital became interested in the iron deposits of the Sierra Maestra. In that year the crown of Spain issued a royal decree to the effect that for a period of 20 years from date mining companies should be free from all tax on the surface area of all claims of iron or combustibles; that ores of all classes should be free from all export taxes; that coal brought in by mining companies for use in their works should be free from all import duties; that combustibles and iron ore should be exempted from the 3 per cent. tax on raw materials; that mining and metallurgical companies should be free from all other impost, and that, for a period of five years, mining companies should be exempt from the payment of duties on all machinery or material required for working and transporting the ores; that vessels entering in ballast and sailing with ore should pay a duty of 5 cents per ton navigation dues, and that vessels entering with cargoes destined for the mining companies should pay $1.30 per ton navigation and port dues on all such cargo, and on the remainder of the cargo as per general tariff.

Inspired by these concessions, the Juragua Iron Company, who had purchased and leased mines at Firmeza, commenced to build a railroad 20 miles long from those mines to Santiago Bay, where they also built a dock. The properties now owned and leased by the company are 16 in number, and are usually called the Lopez mines. They are parts of the Seville, Juraguacito and Firmeza groups, situated 14 to 18 miles east of the city of Santiago de Cuba. The mines now operated are those of the last two groups. Some of the properties, notably the West Mine and West Mine No. 1, have become practically exhausted. During 1901 two new mines, called the Columbia and the Colon, were opened.

Of the Board of Managers of this company, Luther S. Bent, Philadelphia, is chairman, and Josiah Monroe, 305 Girard Building, Philadelphia, secretary and treasurer; C. William Schumann of Santiago de Cuba is financial agent, with title of director, and Thomas Redington is general superintendent of the mines.

The Spanish-American Iron Company were the second corporation in the field. They were organized in 1889 by Samuel P. Ely of Cleveland, and shipped their first cargo in 1895. The first property of this company was the Lola group of mines, from which a standard gauge railroad was built directly to Daiquiri Bay, the shipping point 4 miles distant. Daiquiri is about 16 miles east of the city of Santiago de Cuba. The company have here a steel dock similar to those in use on Lake Superior. The properties now operated by this company include the Lola, Magdalena, Providencia, San Antonio, Berraco and Fausto groups of mines, situated from 20 to 25 miles east of the city of Santiago de Cuba. Besides owning the Lola, Lola Segunda, Barcelona, Resurrexit and San Antonio, the company also lease the San Rafael, Santa Rosa, La Cerradura, La-Llave, Alfredo and Alberto, which form the Providencia group, the Ave Maria, Trinidad, California and Nueva Caridad, which compose the Berraco group, and the Fausto group, consisting of the Fausto, Fausto Segundo, Bufera, Falconera and three fractions. During the last year the Providencia, Fausto and Berraco mines have been opened and developed, and a railroad 9 miles long, intended to tap the Fausto and Berraco groups, has been commenced. It has been estimated that this company have here at last a couple of million tons of ore in sight.

The president of the Spanish-American Iron Company is Charles F. Rand, 71 Broadway, New York; vice-president, Edgar C. Felton; treasurer, Edmund N. Smith, and secretary, Josiah Monroe, all of Philadelphia. Jennings S. Cox, Jr., and George W. Pfeiffer of Santiago de Cuba are general manager and superintendent of mines, respectively.

A Philadelphia corporation called the Sigua Iron Company purchased numerous claims east of the Lola group. They built a breakwater and wooden ore dock at Sigua Bay, and constructed a standard gauge railroad, about 9 miles long, to connect the mines with the bay. Shipments began in 1892, but were discontinued in 1893; the reason given for discontinuance was lack of ore. The buildings and docks were all destroyed during the insurrection of 1897.

The Cuban Steel Ore Company, who, as recently reported, have sold their entire plant to A. V. Kaiser & Co. of Philadelphia, own mines at Guama, about 40 miles west of Santiago de Cuba. The mines lie some 6 miles from the coast at an elevation of from 1500 to 2400 feet. The town of Guama is connected by rail with the seaport of Chirvico, and is half way between the latter place and the mines. At Chirvico are two wharves and a steel ore dock, 1000 feet in length, features that attract the attention of passengers on every vessel sailing along the southern coast. The railroad which connects the dock with the mines is said to be the best equipped piece of railroad work in the island. The mines owned by this company are five in number and constitute the Bacardi group. They include the Victoria, Old England, New England, Pittsburg and All Right. Of these the Victoria, Old England and All Right have been more or less extensively operated.

Character of the Ore.

The iron ore found throughout the Sierra Maestra range is both hematite and magnetite. As it is rich in iron and low in sulphur and phosphorus, it is particularly adapted to the Bessemer process. The average analysis of the ore produced by the Spanish-American Iron Company during 1901 was as follows:

Contents.	Per cent.
Metallic Iron	62.5
Phosphorus	0.032
Silica	7.5
Sulphur	0.11
Copper	0.20

It is interesting to note that the quarry system is used exclusively in the development of all these iron properties, as they are not mines at all in the ordinary sense of the term. The ore is found in small irregular bodies without definite walls near the tops of hills. The ore, which is extremely hard, is loosened from the country rock by means of sledges and explosives, and steam shovels are employed to remove the upper soil and debris. One of the chief difficulties of the proposition is that of sorting the ore from the country rock.

To the east and west of Santiago de Cuba, in the Sierra Maestra range, are many other deposits of iron

ore, many of them located but none of them developed. Among these might be mentioned a group of mines, chief of which is the Camaroncito, 56 miles from Santiago de Cuba, the ore of which is said to average 68 per cent. magnetic iron.

The annual shipments of iron ore from Cuba since the opening of the mines in the Province of Santiago de Cuba in 1884, are shown in the following table:

Year.	Juragua Iron Company, Limited. Long tons.	Sigua Iron Company. Long tons.	Spanish-American Iron Company. Long tons.	Cuban Steel Ore Company. Long tons.	Total. Long tons.
1884	25,295	....	.....	....	25,295
1885	80,716	....	.....	....	80,716
1886	112,074	....	.....	....	112,074
1887	94,240	....	.....	....	94,240
1888	206,061	....	.....	....	206,061
1889	260,291	....	.....	....	260,291
1890	363,842	....	.....	....	363,842
1891	264,262	....	.....	....	264,262
1892	335,236	6,418	.....	....	341,654
1893	337,155	14,020	.....	....	351,175
1894	156,826	....	.....	....	156,826
1895	307,503	....	74,991	....	382,494
1896	298,885	....	114,110	....	412,995
1897	248,256	....	206,029	....	454,285
1898	83,696	....	84,643	....	168,339
1899	161,783	....	215,406	....	377,189
1900	154,871	....	202,001	....	446,872
1901	199,435	....	335,136	20,666	555,237
Totals	3,690,427	20,438	1,322,316	20,666	5,053,847

Province of Puerto Principe.

The Cuban Mining Company, of which Oliver Williams, Catasauqua, Pa., is president; Joseph W. Adams, South Bethlehem, Pa., secretary and treasurer, and Capt. Henry Adams, Neuvitas, general manager, have in the Province of Puerto Principe a group of iron properties as follows: John Fritz, 237 acres; Catasauqua, 276; Pennsylvania, 234; Philadelphia, 86; Pittsburgh, 266; El Yman, 88, and El Panorama, 247. The analysis of samples from these various claims are as follows:

Name.	Metallic iron. Per cent.	Phosphorus. Per cent.
El Yman	66.68	0.053
Pennsylvania	66.29	0.035
Pittsburgh	51.13	0.075
Panorama	51.13	0.099
Philadelphia	64.01	0.085
Catasauqua	63.21	0.090
John Fritz	66.00 to 69.59	0.028 to 0.080

Of the above properties the John Fritz and the El Yman have been thoroughly examined by the diamond drill, and the analyses given above of the John Fritz are the analyses of the different cores. The analyses of the other mines are taken from trial pits dug under the direction of experts sent by the Cuban Mining Company to examine the properties. The ore from the John Fritz is said to be particularly regular in quality, and the company have taken, up to date, over 150 samples, all of which run about as above. This ledge is 25 feet long above the ground, averaging 375 feet in width and 75 feet in hight. El Yman and the Pennsylvania are both of this same formation.

Province of Santa Clara.

The only occurrences of iron ore that seem to have attracted attention in the Province of Santa Clara are in the Trinidad district. Antonio Altamira of Havana has a location of iron at Arroyo Seco on the Upper Cana River, which he calls the Altamira. No work has been done here, but the owner reports that he is negotiating with a New York house to form a company for the exploitation of his prospect. The ore is said to assay 58 per cent. iron. On the Lower Cana River is another location of iron called Vincenta Medina, after the registrar of the property, a resident of Trinidad. Three miles from Engles Landing, on San Juan Bay, is an iron prospect called La Gauva, owned by José Lopez and Vega Capatella y Ca. of Cienfuegos. Venancio Seijo of Trinidad claims to know of deposits of iron ore in the mountains about that city, samples of which assay 75 per cent. metallic iron, and bear a strong resemblance to the iron ore of Vizcaya, Spain.

Provinces of Havana and Pinar del Rio.

In different parts of the island are numerous locations of mines from which the samples assay well in both iron and copper, so that the prospects might be properly classified under either head. Of this nature is the Casilda claim at Campo Florido, in the Province of Havana. This is the property of Juan J. Uribarri of Mercaderes 29, Havana. Exploitation is as yet limited to a gallery about 15 m. long. The property, which is situated 15 miles from the Havana docks on the United Railways of Havana, covers 37 acres of land. Analysis shows:

Specific gravity, 150 degrees C	3.100
	Per cent.
Water	3.3
Iron	44.5
Copper	10.7
Silica	31.5
Undetermined	10.0
Total	100.0

Numerous prospects of iron have been reported from the Province of Pinar del Rio. Iron properties were worked here, years ago, on a sugar plantation near the Bay of Bahia Honda. About 60 miles from Bahia Honda, near Dimas, are deposits recently located by Señor Eduardo M. Acevedo of Havana. He reports that the samples run about 70 per cent. metallic iron, with a little manganese. It is understood that the Cuban Mining & Development Company, Limited, of England, who have been opening up copper properties at Bahia Honda, are also interested in various locations of iron in this province. W. L. C.

Land Grants and Railroads in Australia.

MELBOURNE, AUSTRALIA, May 2, 1903.—Tenders for the construction and working of a land grant railway from Oodnadetta, South Australia, to Pine Creek, in the northern territory, are returnable May 2, 1904, and American syndicates who contemplate considering this are now notified. The length of the line is 1200 miles, the gauge 3 feet 6 inches, with 60 pound steel rails and fastenings. Land not exceeding 75,000 acres per mile, with all gold and minerals thereon will be granted, such land to be selected in alternate blocks on each side of the line.

Tenders must state the number of miles to be laid down each year from each end of the line, and the date of completion. All particulars can be obtained from the office of the Agent-General for South Australia, 1 Crosby square, Bishopsgate street, London.

Your correspondent has not been in South Australia of late, and is surprised to find the country prepared to mortgage its lands in the way proposed. A strong feeling has been afoot that this railway should be a matter for Federal jurisdiction, and opinions have been very divided on the wisdom of the course. An English syndicate already has a representative on the spot.

In spite of any Transcontinental Railway act, the writer is still obstinate enough to believe that public opinion will find expression through its Parliamentary representatives against the acceptance of any "land grant" tender, when the time actually comes for acceptance or rejection. If it will pay English and American syndicates to open up our country for us it will equally pay the State to do so, and as all Australian railways are State owned and State controlled (a few cock spur lines excepted) it would merely mean an extension of the present system.

Your correspondent's conclusions, after many years' observation of these matters, are that we shall get the benefit of foreign tenders, then decide to build the line as a State concern and then shelve the matter with such other trifles as the Perth to Adelaide Railway and Sydney Harbor Bridge.

And at the present the country is too young and population too absurdly scanty for any of the above three projects to make commercial successes. F. B.

A Morgan Continuous Mill for France.—The Morgan Construction Company of Worcester, Mass., have been awarded the contract for a Morgan continuous rod mill to roll two strands, together with furnaces, gas producers, reels and auxiliary machinery, for J. Moulton of Paris, the well-known French manufacturer of steel and wire. This plant will form part of an extensive steel and wire works now under construction near Paris.

Addition to Niagara Falls Power Plant.

The present output capacity of the Niagara Falls Power Company is 80,000 horse-power. This is made up of the 50,000 horse-power installation in power house No. 1 and the 30,000 horse-power in power house No. 2, in which six new generators have been installed. When fully completed the output capacity of power house No. 2 will be 55,000 horse-power, which means that five additional generators will be installed, making a total of 11 in power house No. 2, or a grand total of 21 in the two big power houses.

The six new generators installed in power house No. 2 are of General Electric make, and the same company are to furnish the entire electrical equipment of the station. These six new generators are of particular interest, because the iron bridge over the generators in power house No. 1 has been omitted in building these latest Niagara power producers. The omission of this iron bridge results from the fact that the collector rings of the new machines are placed at the bottom of the dynamo shaft instead of at the top. The new generators are, however, of the external field type, with the nickel steel revolving magnet ring. Each generator is of 5000 horse-power capacity, wound for 2300 volts, two-phase, 25 cycles at 250 revolutions per minute. The new generators are capable of much closer regulation than the generators in power house No. 1, and this, with the fact that the entire plant of power house No. 2 will be operated from a single switchboard, and also the protection of the feeders with automatic oil circuit breakers, form the main points of difference between the installations of the two wonderful plants.

Through the closer regulation constancy of voltage on the system is insured with variations of load, while the unbalancing of voltages on the different phases by differences in loads is reduced to a minimum. This result is an important factor at Niagara, especially to the Niagara Falls Power Company. While many systems of electrical distribution supply a large number of small consumers, the doings of any one of which have but slight effect on the voltage, the Niagara Falls system supplies a small number of large consumers, and the change in load at any one of the plants might cause a marked disturbance on the circuits. In addition to this feature of the Niagara development there is the further fact that single-phase electric furnaces are supplied with current taken from one-phase, giving an inequality of load on the phases and unbalancing the voltages. By the use of generators of close regulation the results are made inappreciable.

In the new generators a different system of ventilation is employed than in the generators in power house No. 1. Air actuated by centrifugal pressure enters the generator at the bottom side of the armature shell, passing outward through the air ducts in the armature core, and continuing outward between the layers of the field winding to a space at the back of the field coils and out through holes in the magnet ring. Holes for ventilating purposes are also provided at the top of the ring.

The five other generators to be installed in power house No. 2 will be of the internal revolving field type, so that in the two stations the company will have three types of generators. These five machines will be wound for 2300 volts, two-phase, 25 cycles, and will make 250 revolutions per minute. They will be of 5000 horse-power each. It will be possible to operate all the machines in parallel, and the current of the two houses will be interchangeable.

The exciter plant of power house No. 2 has been installed in a chamber excavated in the side of the wheel pit. The equipment consists of four 150 kw. compound

Interior of Power House No. 2.

ADDITION TO NIAGARA FALLS POWER PLANT.

wound vertical shaft 220-volt exciters, each of which has its individual turbine placed directly underneath. The speed is 750 revolutions per minute, each exciter turbine having its own governor.

In general appearance power house No. 2 resembles the original station of the Niagara Falls Power Company, but several features have been added to increase its beauty. The building is of stone and stands over wheel pit No. 2. This wheel pit is on the opposite side of the inlet canal to wheel pit No. 1 and nearer the river. A connecting tunnel 130 feet below the surface allows employees to pass from one pit to the other under the inlet canal. A new feature in connection with the new station is a covered forebay structure, Fig. 2, which extends along the canal side of the power house and is about 40 feet wide. The water enters the forebay from the inlet canal through arches, the tops of which are below the surface, a fact that should aid in preventing ice and drift troubles. Before passing to the penstocks the water passes through racks. The wheel pit is 178½ feet deep, 18½ feet wide and 463 feet 8 inches long. Eleven turbines of 5000 horse-power each will be installed in the pit.

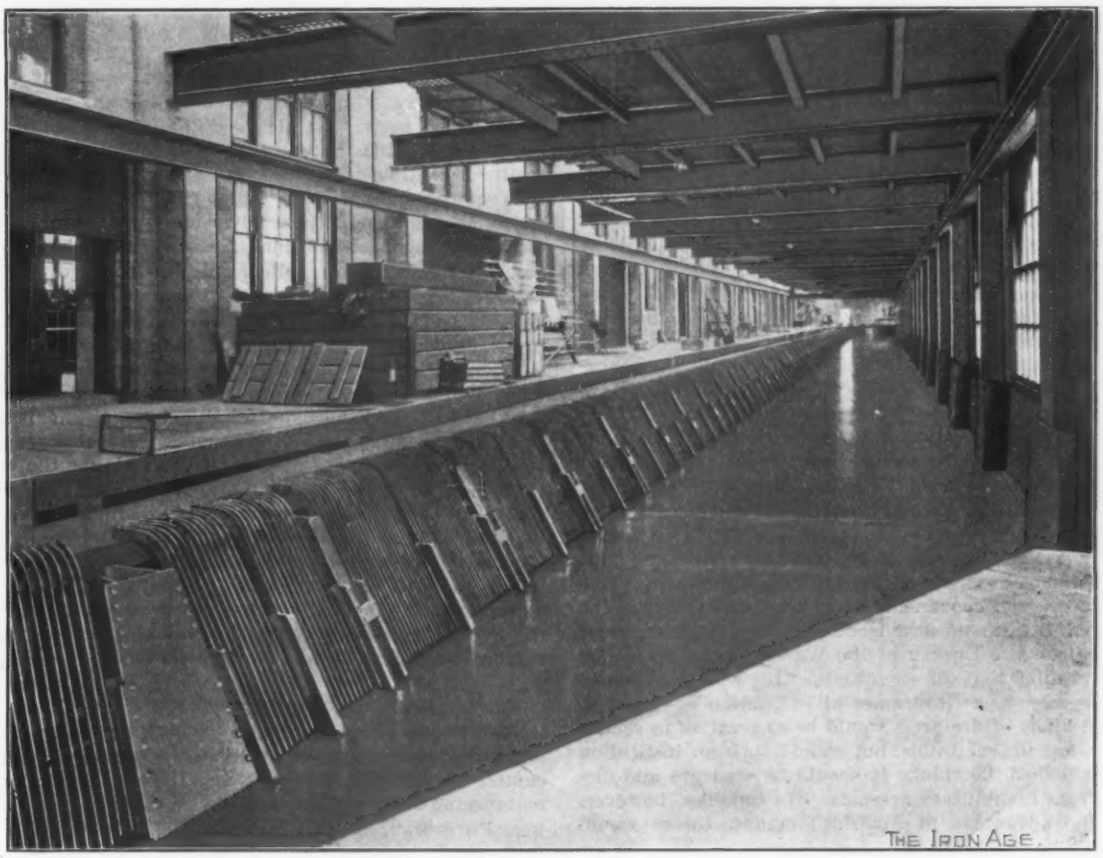


Fig. 2.—Interior of Covered Forebay of Power House No. 2.

ADDITION TO NIAGARA FALLS POWER PLANT.

These turbines are made by the I. P. Morris Company of Philadelphia, but designed by Escher, Wyss & Co. of Zurich, Switzerland. The governors were built by A. Falkenau of Philadelphia, after designs made by Escher, Wyss & Co. The turbines in wheel pit No. 1 are double wheels, while those in wheel pit No. 2 are of the internal discharge type, the discharge water being carried off through draft tubes. The new wheels are said to give an increased efficiency of about 10 per cent.

When the installation of power house No. 2 is completed the company will have 105,000 horse-power at their command, 50,000 of which will be generated in station No. 1 and 55,000 in station No. 2.

A Furnace Record.—The Longdale Iron Company of Longdale, Va., have made an exceptionally good record. During the first quarter of the current year the two furnaces running on chilled basic made 98.9 per cent. of standard iron. Only a fraction over 1 per cent. of the iron made during that time was off, either exceeding 1 per cent. of silicon or 0.05 of sulphur.

Phosphor Tin Free of Duty.

The Board of United States General Appraisers, at New York, on May 21, reversed the decision of the collector of customs at Plattsburg, N. Y., and sustained the protests of the importers, F. W. Myers & Co., as to the rate of duty on phosphor tin. It is entitled to free entry as tin. The decision is as follows:

The merchandise in question consists of so-called "phosphor tin." It was returned by the local appraiser as a "manufacture of tin," and duty was assessed thereon at the rate of 45 per cent. ad valorem under the provisions of paragraph 193 of the act of July 24, 1897. The importers claim that the merchandise is entitled to free entry under the provisions of paragraph 683 as tin.

An analysis made by the Government chemist in the laboratory at the port of New York shows that the merchandise consists of 98.80 per cent. of tin and 1.17 per cent. of phosphorus. It appears from the testimony of the importers that the phosphorus found in the imported article was added by a process of manufacture, and that many varieties of tin contain either phosphorus, lead or antimony, which have been added to produce certain requisites for which tin is frequently used in manufacture, and that all of them are known and dealt in as tin. While the article before us is undoubtedly a manufacture, it is nevertheless only a form or species of tin. By the process mentioned its name, character and use have not been changed, for it is tin and nothing more. The case falls within the ruling laid down in Dennison *vs.* United States (72 Fed. Rep., 258), wherein Judge Lacombe said:

"The article has been advanced beyond the condition of tissue paper into something else, which may fairly be

called a manufacture of paper, but which, since it is still paper and paper only, may more appropriately be classified among the 'all other paper.'"

Note, also, G. A. 5338 (T. D. 24,426).

The protests are sustained and the decision of the collector reversed.

Governmental Testing of Fire Arms.

Movement for Establishment of Proof Houses.

WASHINGTON, D. C., June 2, 1903.—The establishment of proof houses for the testing of fire arms under Governmental supervision is a subject that has recently been taken up by certain manufacturers in the hope of interesting the appropriate officials of the Government to such an extent as to insure whatever legislation may be necessary to secure the required plant and appurtenances. The matter is one of constantly increasing importance to domestic manufacturers, especially because of the rapid expansion of the export trade in recent years.

It is stated by leading manufacturers that much annoyance is experienced by exporters of American fire arms, especially to Great Britain, but also to certain countries of Continental Europe, because of regulations in force which require such articles to be tested under official auspices either in the country of manufacture or in that of sale. American fire arms shipped to Great Britain, for example, are required to be sent to British proof houses and thoroughly tested and stamped before being reshipped to the dealers to be placed on the market. The establishment of proof houses under Governmental auspices in the United States would, it is suggested, not only enable American manufacturers to have their products tested and stamped before shipment, thereby giving them a certain prestige which they do not now enjoy, but would also serve to protect the home market against the importation of cheap fire arms, which by statute could be required to pass certain proof house tests before being sold.

This interesting subject is attracting considerable attention among officers of the Ordnance Bureaus of the War and Navy Departments and among the experts of the National Bureau of Standards. General Crozier, chief of the Ordnance Bureau of the War Department, is disposed to think that the magnitude of the work that would find its way to a Governmental institution equipped to test all kinds of fire arms would be so great as to render the project impracticable, but should such an institution be established, he thinks it should be separate and distinct from the military arsenals. He concedes, however, that the advantage to American manufacturers would probably be considerable.

Admiral O'Neil, chief of the Ordnance Bureau of the Navy Department, thinks very well of the plan. To the correspondent of *The Iron Age*, he said:

"I can see at a glance that the establishment of proof houses under some kind of official auspices would be of great benefit to manufacturers of fire arms, and especially to producers of high-class weapons for export. It would be a large undertaking, and its success would depend entirely upon the extent to which manufacturers of the country support the movement, for I assume that in order to make such a plan practicable legislation involving at least a moderate appropriation would be necessary. The results, however, might prove so satisfactory as to warrant almost any expense that might necessarily be incurred."

Favored by Director Stratton.

The most promising point of beginning for such an institution appears to be in connection with the development of the National Bureau of Standards, which is almost daily enlarging the scope of its various testing departments. Director Stratton, who is giving special attention to the development of new fields for the bureau's work, expresses his willingness to undertake the testing of fire arms if the manufacturers will induce Congress to provide the necessary appropriation for land and buildings. To the correspondent of *The Iron Age*, he said:

"I appreciate fully the attitude of the American manufacturers of fire arms who are obliged to send their products to proof houses in foreign countries before placing them on foreign markets. A similar condition of affairs with regard to manufacturers of measuring and other scientific instruments was one of the chief considerations that finally brought about the creation of the National Bureau of Standards. Our manufacturers found themselves obliged to send their instruments all the way to Berlin to have them tested and stamped before being able to sell them even in our domestic markets. The producers of fire arms have a further incentive to secure the establishment of proof houses for the reason that in addition to testing their own productions they would be able to shut out cheap foreign articles that would not meet the official specifications.

"Our bureau is developing as rapidly as possible with the appropriations given us by Congress, and it would be a very simple matter to add a proof house for the testing of fire arms. The authority under which we work is ample to include such tests, but we are without funds for the purpose. It has been the policy of the bureau from the outset not to press its services upon any class of manufacturers, but to take up promptly any work that is presented to us. So far as this particular matter is concerned, it seems to me that in order to make it effective legislation would be necessary not only to provide the required appropriation, but to establish such requirements as might be deemed advisable with regard to the testing of imported and domestic products. The project seems to me to be an excellent one, but its success would depend almost entirely upon the unanimity of action on the part of manufacturers and the energy shown by them in bringing the matter to the attention of Congress."

The Bureau of Standards will soon move into its new quarters in two commodious buildings located in an 8-acre park in the suburbs of Washington. It is expected that at the coming session of Congress several acres will be added to this tract, which will be ample for the location of proof houses and their appurtenances. As suggested by Director Stratton, however, manufacturers interested in this project will find it necessary to induce Congress to grant a moderate appropriation to provide buildings, &c., and also to specify any desired official requirements. It is assumed that the proposed adjunct of the Bureau of Standards could easily be made self supporting through small fees charged for the tests made.

W. L. C.

The Union Forge Company.—The Union Forge Company of Pittsburgh have organized at Pittsburgh with a capital of $500,000, and will manufacture rivets, bolts and forgings. A new plant will be erected on Second avenue, Pittsburgh, and will consist of a building 105 x 50 feet, which is expected to be completed in August, and which will be built by the McClintic-Marshall Construction Company of Pittsburgh. The equipment, which has been purchased, will include a 1500 and an 800 pound steam hammer, 60 horse-power Westinghouse gas engine, automatic rivet and bolt making machines, &c. Jesse B. Marshall, of the McClintic-Marshall Construction Company, is at the head of the new company. The temporary office of the company is in room 1214, Park Building.

Official announcement is made that the owners of the stock of the Christensen Engineering Company, Milwaukee, Wis., have organized the National Electric Company, and the assets, good will, &c., of the Christensen Engineering Company have been transferred to the National Electric Company. The purposes, ownership, management and control of the new are identical with those of the old company. It is understood that the capital stock of the National Company has been increased over that of the Christensen Engineering Company, to provide funds which will be utilized in new construction and providing additional equipment to increase the capacity of the plant made necessary by the increased demand for electrical machinery and air brakes. Plans have not been sufficiently matured to give detailed information, but a report is current that the company contemplate erecting a foundry and extending the present shop to double its present size and capacity.

The Reid Ball Bearings.

The Reid antifriction bearings consist of several styles of ball bearings, including both thrust and radial bearings. The thrust bearing, Figs. 1, 2 and 3, was designed to meet the various requirements where it is desired to support the axial thrust of shafts, and the aim was to construct a bearing in which there would be rolling contact only between the balls and ball race ways. The two points of contact, A and B, Fig. 3, on the lower plate are in such a position in relation to the axis of the shaft that the rolling contact circles on the balls are both in the same proportion to the contact circles on the plate. In other words, the circle B bears the same relation to its contact circle on the ball as the circle A does to its contact circle on the ball. The contact on the upper thrust plate is in a plane parallel to a line drawn through the two points of contact on the lower plate, and it is, therefore, evident no sliding can take place between the balls and race ways, and the load on the two points

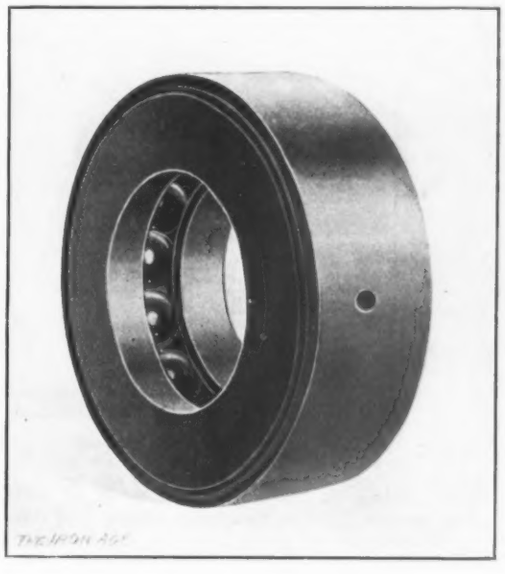


Fig. 1.—Thrust Bearing.

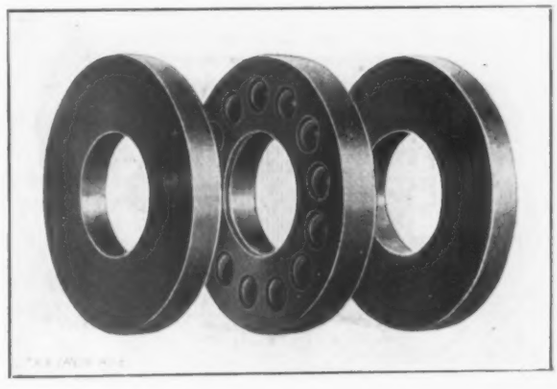


Fig. 2.—Thrust Bearing.

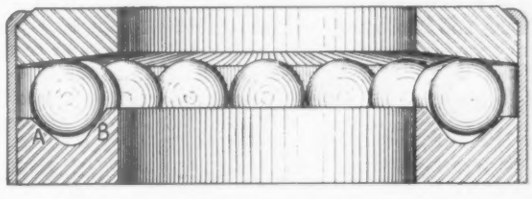


Fig. 3.—Thrust Bearing.

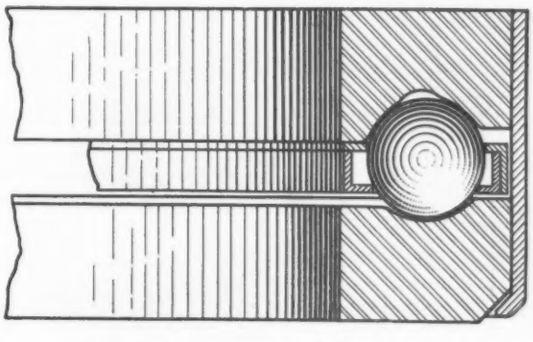


Fig. 4.—Thrust Bearing.

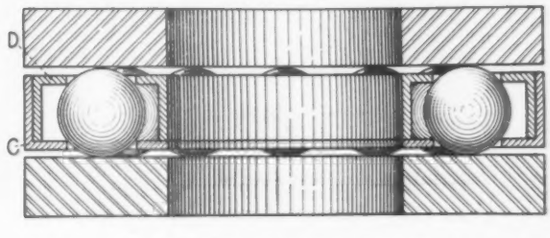


Fig. 5.—Simplest Thrust Bearing.

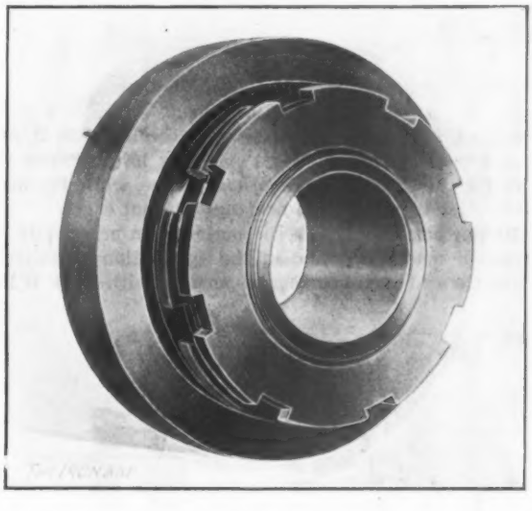


Fig. 6.—Radial Bearing.

Fig. 7.—Radial Bearing.

THE REID BALL BEARINGS.

of contact must be equal. The tendency to force the balls outward on account of the difference in the angles of the lower plate is counteracted by the angle of the face of the upper plate forcing them in the opposite direction.

A similar thrust bearing, shown in section in Fig. 4, is particularly adapted to very heavy loads at moderate speeds, and the points of contact between the balls and plates are in the same relation to each other and to the axis of the shaft as in bearing Fig. 3. The features of this bearing which give great wearing qualities and ability to carry very heavy loads are the curved race ways, which are made to conform to radii somewhat larger than the radius of the ball, and the difference in the radius to which the groove in upper plate is formed and that to which the sides of groove in lower plate are formed is such as to give equal curvature contact in the grooves of both plates.

Fig. 5 represents the simplest form of a ball thrust bearing. The principal point of novelty in this bearing is in the ball retaining cage, which is made of machine steel, and though light is unusually strong and durable. The cage consists of two parts, an outer and an inner cup, C and D, which are pressed together after the balls are placed between them. The thickness of the cage is nearly equal to the diameter of the balls contained in it, and by this construction sufficient metal is left between the holes for the balls to make a strong cage, while the balls are as close together as in bearings without cages.

Radial bearings are in the majority in practically all classes of machinery, and in the application of antifriction devices to such bearings, especially with balls, it has

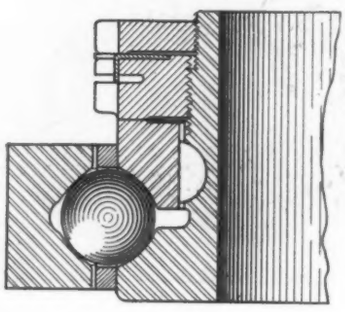
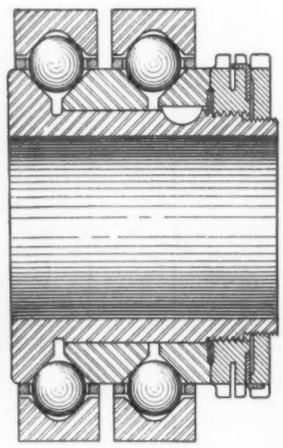
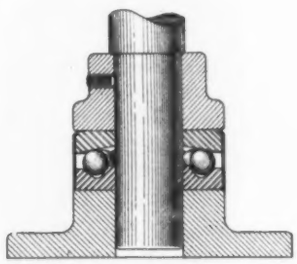


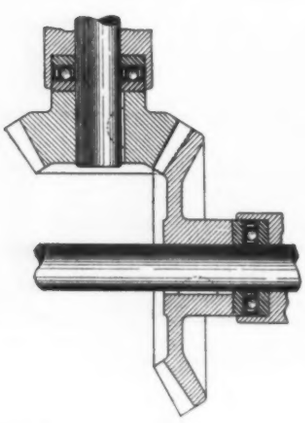
Fig. 8.—Radial Bearing.



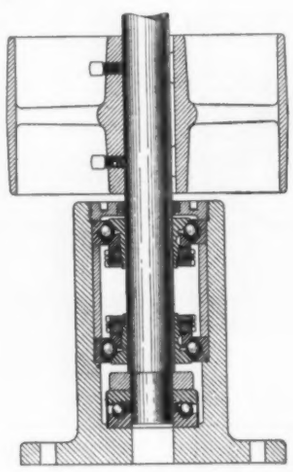
Two-Unit Radial.



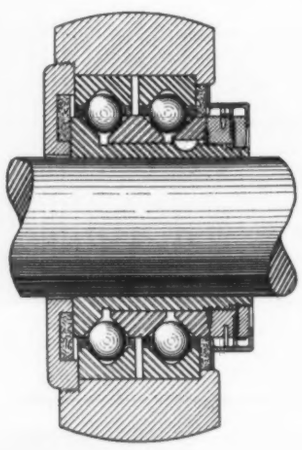
Rigid Step Bearing.



Taking Thrust of Bevel Gearing.

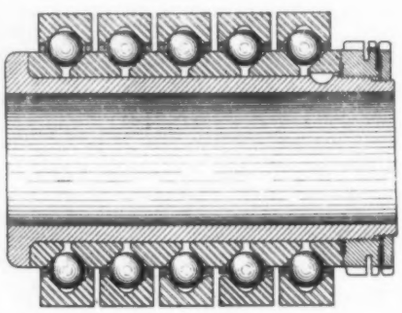


Combined Radial and Thrust Bearing.

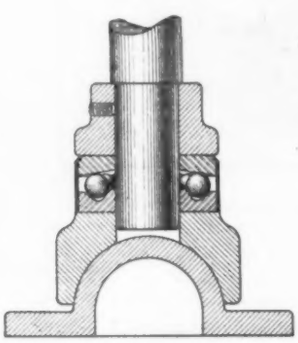


Self Aligning Box.

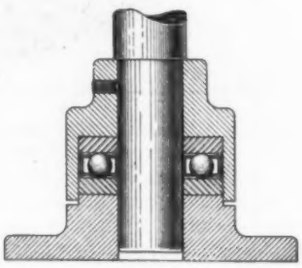
Drill Spindle Bearing.



Five-Unit Radial.



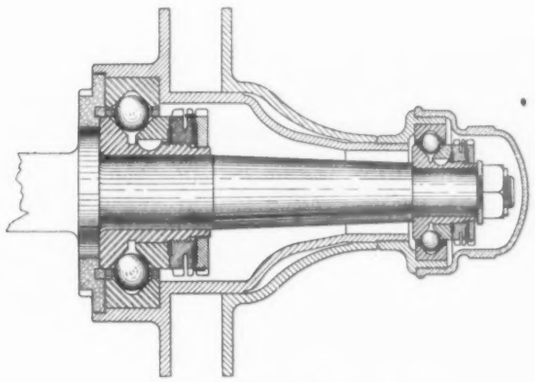
Self Aligning Step Bearing.



Rigid Step.

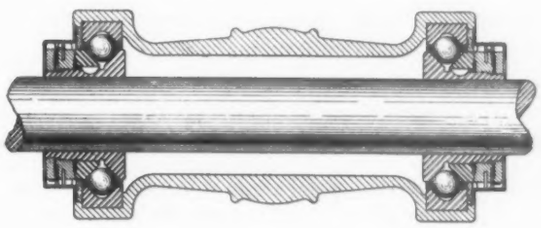
THE REID BALL BEARINGS.

generally been necessary to make all parts of the bearing special or an integral part of the machine to which it is applied. Fig. 7 shows a sectional view of a new single unit radial bearing which is self contained, capable of easy adjustment for wear, and was designed to cover a wide field of application. The nut lock by which



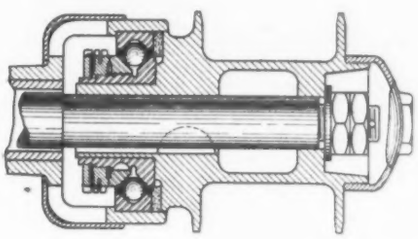
Artillery Hub.

means for adjustment is provided is one of the main features of the bearing, and is composed of an extended sleeve support, E, formed with screw threads of opposite pitch, and coacting nuts, F and G, both of which are re-



Applied to Ordinary Shafting Box.

silient in an axial direction at their contact portions. The inner face of the inner nut is presented rigidly to the adjustable cone H, and the opposite face of the inner nut is formed in the shape of a marginal resilient flange,

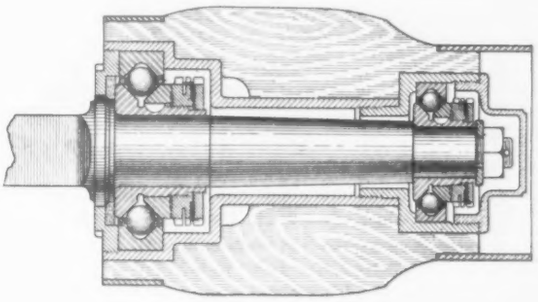


I. Between this flange and the engaging portions of the outer nut is contained a locking washer, J, having flexible teeth adapted to coact with the notched portions of the two nuts.

The outer nut F is also resilient in an axial direction on account of the web portion between the outer contact portions and the inner threaded part not coming in contact with the inner nut. The notches forming the teeth on the periphery of the locking washer J are differently spaced from those on the two nuts. In adjusting the bearing the inner nut is screwed up until there is no play between the balls and race ways, then the outer nut is forced up until one or more of the teeth on the locking washer can be bent into the notches of each nut, thereby forming a solid, compact, positive lock at any adjustment. A ball separating ring or cage, K, is generally used, but is omitted in bearings where the conditions do not require one; this cage consists of a ring, which is made a running fit on the cones L and H.

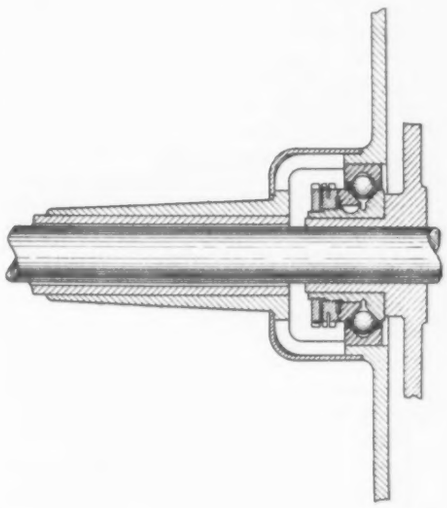
Accidents resulting from the breaking of balls or the cracking of race ways, such as would destroy ordinary ball bearings, are practically impossible in this bearing, as the sleeves are made a running fit on the shafts to which they are applied. For instance, should a ball or race way break and the bearing stick, the shaft sleeve would run on the shaft as in a plain bearing.

The sectional drawing, Fig. 8, illustrates a bearing similar to the one shown at Fig. 7, except in the shape of the race ways, which are curved to conform to radii



Wooden Wheel Hub.

slightly larger than the radius of the ball and the difference in radius to which the ring race ways, shaft sleeve and cone race ways are formed is such as to give equal curvature contact on the outer and inner race ways. The balls in both of these radial bearings have four points of contact with a positive rolling action, and no sliding or slipping can possibly occur. This bearing, Fig. 8, was designed particularly for heavy loads at moderate



Applied to Automobile Driving Axle.

THE REID BALL BEARINGS.

speeds. A few of the many applications of these bearings are shown in the accompanying drawings. This line of ball bearings is manufactured by the American Ball Company of Providence, R. I., under the Reid patents.

The Worcester Metal Trades Association have taken rooms for their labor bureau and have engaged Herman S. Hastings of Worcester to have charge of the bureau, under the supervision of Secretary Charles E. Hildreth and other officers of the association. The rooms will be occupied as soon as they can be furnished. The association are studying the matter of a system for the conduct of the bureau and have several plans under consideration.

Scientific and Technical Notes.

Mr. Yarrow, the celebrated English shipbuilder, comes out strongly against the submarine boat as a war craft. He says that he has no faith whatever in the submarine boat, either for offensive or for defensive purposes. He does not consider that anything practical will ever result from the experiments which all maritime nations are making in this direction. Submarines, if entirely successful or otherwise, would be of use only against stationary vessels. For the purpose of attacking vessels in motion they could not be guided, he maintains, with sufficient accuracy and knowledge to be relied upon, while, even if they could, at least as much has been accomplished already by torpedo boats with far less risk and cost.

Some tests on the strength of paper, made during the past year at the Watertown Arsenal, showed that strong blue print paper had a strength of 9700 pounds per square inch, while with a linen paper the strength was 9000 pounds per square inch.

On the roof of the Western Union Telegraph Building in lower New York is a steel tower 105 feet high, on top of which is a pole 25 feet high, down the length of which a time ball drops at exactly noon each day. The ball consists of a framework of brass rods, bent into spherical shape and covered with stout canvas. It is dropped by an electrical impulse sent from Washington, and the instant it reaches the base of the pole this fact is automatically communicated to Washington through the medium of an electric telltale. The noon signal is transmitted from New York by a bank of relays to 142 circuits connecting all the principal cities and towns throughout the country. The services of the telegraph company are at the exclusive disposal of the Government for three or four minutes immediately before and after 12 o'clock, noon, for the carrying out of this programme.

The British Westinghouse Company have obtained an order from the Metropolitan District Railway Company of London for four turbo-alternators, each of a normal capacity of 5500 kilowatts, and capable of carrying an overload of 50 per cent., giving for each unit a maximum output of 8250 kilowatts, or about 11,000 horse-power. These will be not only the largest steam turbines ever made but also the most powerful single cylinder engines of any type whatever in the world. Very few multiple-cylinder engines have greater power. The engines are 29 feet in length by 14 feet wide and 12 feet high, the overall length of turbine and alternator being 51 feet 9 inches. The steam pressure will be 165 pounds per square inch, and the speed 1000 revolutions per minute.

It is expected that the British Navy will be increased in the coming year by the completion of six battle ships, eleven armored cruisers, one second-class cruiser, two sloops, four destroyers, eight torpedo boats, and three submarines. Notwithstanding this large augmentation, a new programme has been advanced, comprising four first-class armored cruisers, three third-class cruisers, four very fast scouts, fifteen destroyers and ten submarine boats. As similar augmentations may be expected in future years, it follows that finality can never be reached, either in the position of the fleet or of the expenditures upon it.

It is estimated that the lead cell of an automobile storage battery is capable of lifting its own weight through a hight of about 5¾ miles, in expending its energy without waste. Compared with a good piece of steam coal, however, this figure sinks into insignificance. The latter contains enough potential energy to raise its weight some 2000 miles, against the attraction of gravitation; this makes it about 350 times as rich in energy as is the storage battery. As only 5 per cent. of the energy of the coal is available for use in an automobile, while some 20 per cent. of the energy of the storage battery is so available, the ratio of disparity is reduced from 350 to about 90. Even at 90 to 1, the energy storage capacity of coal or petroleum is far ahead of that of electric storage cells.

In an address before the Manchester Association of Engineers, E. G. Constantine refers to industries in England and in America: "Last year I spent a few weeks in the United States, and I am free to confess that I was very considerably impressed by some of the methods in vogue in that country. Any expectations of finding the men working excessively hard were not realized, in such works as I visited, and I spent a good deal of time in some of them. I failed to discover any evidences of exhausting labor, but, on the other hand, there was an absence of that happy-go-lucky, wandering-about-with-a-piece-of-wood fashion, which we are so painfully conscious exists in some of our works in Britain. Each man appeared to know his job and to stick at it, and sullen faces were the exception. In the administrative and commercial departments the contrast between American and British practice was startling, and revealed the great factors tending to the success of American enterprises—enthusiasm and loyalty."

In a recent lecture before the Keighley Technical Institute, it was stated that the power required to drive a lathe increases at a much higher ratio than the increase of cutting speed, other conditions being equal. With a cut 3-16 inch deep by 1-16 inch feed, at a surface speed of 80 feet per minute, the power required was eight times that with the same cut, and a speed of only 20 feet per minute. This ratio is on the basis of the three-halves power of the cutting speed. Mention was made of a 24-inch lathe driven by a 26 horse-power motor, which, with a certain piece of work in position, took 6½ horse-power for running, without the tool's touching the work. With a cut ¼ inch deep, removing about 5 pounds of metal per minute, the power required was 13 horse-power, or 6½ for the work alone. When the cut was increased to ⅜ inch in depth, and the corresponding removal of material to 7 pounds per minute, the lathe absorbed no less than 20 horse-power, an increase of 7 for the additional 2 pounds of metal per minute. Thus, so far as power is concerned, the last 2 pounds cost more than the first 5, though, of course, the first 6½ horse-power required to operate the lathe, irrespective of the load on the tool, considerably augments the total relative amount of power absorbed at low loads.

An estimate of the water powers developed in the several countries was given by A. Gradenwitz, in a paper before the Frankfort Congress of German Naturalists and Doctors. His figures are as follows: Germany and Austria, 180,000 horse-power; Switzerland, 160,000 horse-power; Sweden, 200,000 horse-power; the United States, 400,000 horse-power. He estimates the total power available in a number of countries to be: Sweden, 2,000,000 horse-power; France, 10,000,000 horse-power; Germany, Austria, Switzerland and Italy, together, about 10,000,000 horse-power; while in the United States the Niagara Falls alone could furnish 10,000,000 horse-power.

The main difficulty to be overcome in the case of the application of electricity to heavy railway work is not the transmission of power, as such, but the low voltage which is, up to the present, usually employed on the working conductors. This is a very serious matter in large work. The ordinary freight or express train, as now made up for railway service, would require from 1000 to 1500 amperes at 600 volts, and no method has as yet been devised for the collection of so large an amount in a satisfactory manner. The one direction in which to look for great and revolutionary improvements such as will make heavy electric traction commercial is the utilization of high voltages on the working conductors. Until this is accomplished the great cost of these conductors and the difficulty of collecting the large currents required will militate seriously against the adoption of any such system for trunk line work. Of course, if consideration could be confined to passenger

traffic alone, the problem would be solved by the use of a large number of large motor cars, which would relieve the difficulty in the matter of collecting the current, but nothing confined to the passenger traffic is likely to be seriously considered when freight continues to furnish three-fourths of the revenue of the lines under operation. The Germans have been experimenting (at Zossen) on the adaptability of an electric locomotive to accept current direct from the wires at the enormous tension of 10,000 volts, at which pressure it has actually been applied to the motors. Such conditions, however, are not very likely to be largely adopted, if only because of the immense amount and high character of the insulation required.

A section of the submarine cable between Cienfuegos and Santiago, in the Caribbean Sea, has recently been raised, with some very interesting results. The cable was manufactured in 1873 and was laid in 1881. Some few months ago a question arose as to the durability of cables covered with India rubber, as in this case, and it was decided to raise the Cienfuegos cable and subject it to tests. The line was picked up in 1350 fathoms of water, in April, and tested at the works of Messrs. Hooper, at Millwall, England. The tests of the core showed that after 20 years' submersion it was still in perfect electrical condition. An examination of a specimen a foot long showed that the insulation was still in good mechanical condition, and that the copper conductor had not suffered from the attack of any sulphur in the rubber.

Lord Rayleigh has for some time past been carrying out experiments relative to the surface tension of liquids. This tension is at the maximum in pure water, but by the application of a small drop of oil or grease the tension is considerably reduced. This fact may easily be demonstrated by dropping a small piece of camphor into pure water, when it will rotate rapidly. If a drop of oil be now applied to the water the rotary motion ceases immediately. According to Lord Rayleigh, a film of oil on water may be so thin that its thickness is no more than the twenty-five-millionth part of an inch—which is computed to be in all probability the diameter of a molecule of the oil.

Wire Core Cordage and Belting.—The Ryder Belt & Cordage Company, recently incorporated at Buffalo, N. Y., with a capital stock of $200,000, have secured a four-story factory building on Niagara street, and are equipping it with special machinery for the manufacture of wire core woven belting and wire core cordage, under patents which they control. Each strand of the cordage and each strand entering into the construction of the belting contains a core of steel wire around which the strand is woven. The claim made for this process is that in adhesion, pliability and durability the belting is superior to leather belting, and that ropes made by this process possess twice the strength of ordinary Manila rope. Henry Ryder of Boston, the inventor of the process and of the special machinery required, will be manager of the company, and John M. Patterson of Pittsburgh will be president. The machinery will be electrically operated with Niagara Falls power. Others interested are De Lancey Rankine, Richard F. Rankine, George E. Laverack, A. C. Goodyear, George A. Cole and C. R. Wyckoff of Buffalo, L. C. Fuller of Chicago and Charles Stearns of Corning, N. Y.

It is understood in Hartford, Conn., that the business of the American Bicycle Company will be concentrated to a considerable extent at the Pope factories in that city. Since the American Bicycle Company acquired control of the Columbia Company's business the Hartford plant has not been rushed and a large amount of the shop space was not utilized. Now that Colonel Pope has come into virtual control of the business, according to the popular understanding, Hartford is to be a considerable gainer.

April Imports and Exports.

The statistics of imports and exports for April, which have just been issued by the Bureau of Statistics of the Treasury Department, show that the heavy imports of iron and steel into this country were maintained during that month and that the tide of importation was still mounting upward, as had been the case during the preceding months of this year. The total imports of all iron and steel during April for which quantities are given in the statistical tables were 161,062 gross tons, as compared with 126,575 tons in March and 97,908 tons in February. They were considerably over three times as great as in April, 1902. The imports for the four months ending April also show a very heavy increase as compared with the first four months of the previous year, the totals being 569,466 tons and 132,505 tons respectively. The details are as follows:

Imports of Iron and Steel.

	April.		Four months.	
Commodities.	1903. Tons.	1902. Tons.	1903. Tons.	1902. Tons.
Pig iron	99,944	19,067	315,438	52,441
Scrap	9,298	5,529	33,678	11,418
Bar iron	2,381	900	16,290	6,137
Rails	11,116	673	54,205	2,640
Hoop, band or scroll	114	130	296	1,122
Billets, slabs, bars, &c., steel in forms, n.e.s.	29,014	11,987	119,321	26,101
Sheets and plates	411	561	2,711	2,603
Tin plates and terne plates	6,362	5,436	19,164	24,329
Wire rods	1,877	1,293	6,767	4,261
Wire, and articles made from	496	465	1,435	1,348
Chains	49	25	161	105
Totals	161,062	46,066	569,466	132,505

It is interesting to note in turning to exports that the figures for this year show a gain in April over preceding months. The total exports in April for which quantities are given aggregated 32,593 gross tons, as compared with 26,627 tons in March and 21,727 tons in February. The gain over March is found in bar iron, wire rods, steel rails, steel sheets and plates, structural iron and steel, wire and wire nails. The gain in wire rods was nearly 3000 tons, and in steel rails and wire over 1000 tons each. The exports during the month were but slightly under those for April, 1902. Comparing the figures for the four months ending April, the exports for this year do not show up so favorably, as the total for the first four months of 1903 was only 98,403 tons, against 144,899 tons in the corresponding period of last year. The details of this movement are as follows:

Exports of Iron and Steel.

	April.		Four months.	
Commodities.	1903. Tons.	1902. Tons.	1903. Tons.	1902. Tons.
Pig iron	1,143	1,570	4,982	12,982
Scrap	271	1,220	1,313	4,091
Bar iron	3,560	3,857	7,504	7,276
Wire rods	5,612	1,466	10,236	2,870
Steel bars	885	453	7,591	4,058
Billets, ingots, blooms	54	68	565	525
Hoop, band and scroll	356	195	881	811
Iron rails	7	27	381	168
Steel rails	1,575	4,501	2,612	33,125
Iron sheets and plates	354	314	713	1,254
Steel sheets and plates	1,670	2,076	4,387	3,789
Tin plates and terne plates	4	92	153	645
Structural iron and steel	2,234	4,805	9,986	31,553
Wire	11,104	10,509	35,322	31,946
Cut nails	683	670	2,530	2,387
Wire nails	2,876	1,702	8,584	6,753
All other nails, including tacks	205	178	663	666
Totals	32,593	33,703	98,403	144,899

The imports of iron ore in April amounted to only 49,086 gross tons, against 116,731 tons in April, 1902. The total value of all iron and steel imports, not including ore, in April, 1903, was $4,643,010, against $2,379,884 in April, 1902. The total value of all iron and steel exports, not including ore, in April, 1903, was $8,929,233, against $9,320,633 in April, 1902. Taking the ten months ending April 30, 1903, the value of the exports of iron and steel, not including ore, was $79,834,953, against $82,388,463 in the corresponding period of the fiscal year 1902. The falling off, therefore, in the total value of iron and steel exports during the present fiscal year has not been very heavy, amounting to only about $2,500,000.

Notes from Great Britain.

Railroad News.

LONDON, May 23, 1903.—The Board of Trade has just issued a Parliamentary return relating to the working of railways in the United Kingdom for 1902. The figures, which are subject to revision, show that the total paid up capital was £1,216,804,000, against £1,195,564,478 in 1901. The gross receipts were £109,534,000, against £106,615,753, and the working expenses £67,907,000, against £67,546,677. The net receipts were £41,627,000, against £39,069,076.

Tenders are to be invited very soon by the Norwegian State Railway authorities for the supply of something like 150 locomotives, 50 of which are intended for express purposes, and capable of maintaining a speed of 50 miles an hour, and the rest for heavy goods traffic. It is of interest to note in this connection that two Norwegian railway officials are at this moment in the United States examining those American railway methods of which we have recently been hearing so much.

Thomas Robertson, who was selected by the Secretary of State for India to examine the whole question of Indian railways, has issued his report. He condemns the present system generally, but not the men who work it, and recommends that an independent board, presided over by a member of the Viceroy's Council, should control the whole of the railway systems of the country. He further expresses a preference for managing the railways by means of private companies and not by State control. He is not likely to have his preference acceded to.

Tenders will shortly be invited for the supply of 5445 tons of cast iron chairs, as well as steel axles for carriages and wagons for Indian railroads. The South Indian Railway Company are in the market for five six-wheel locomotive engines, coupled with tenders, and 70 steel wagons.

Events in British Coal Fields.

Up to a few weeks ago it was doubtful whether there would not be a large strike in that portion of Great Britain affected by the Miners' Federation. The federated coal owners passed a resolution that the present rate of wages be reduced by 5 per cent. as from the making-up day in May. The Miners' Federation, on the other hand, resolved in conference that the present rate of wages be advanced by 10 per cent., as from the making-up day in May. The whole question was carefully considered by the Board of Conciliation. Skilled accountants for both parties were called to examine the books in regard to the selling prices of coal, and this was a work that occupied several months. Finally the matter was referred to Lord James as arbitrator, and his judgment is to the effect that neither the proposed reduction nor the proposed advance in wages is at present justified.

In South Wales the promoters of the South Wales Anthracite Coal Amalgamation estimate that over 80 per cent. of the firms will join the proposed combine. In conversation a few days ago with a gentleman interested in this combine, he told me that he hoped it would be carried through. Upon the other hand, I have reason to believe that the scheme will prove to be abortive.

A discovery of coal has been made at Prestonpans, Haddingtonshire. The Firth Collieries Company recently acquired the Preston Links Mines, which have been shut down for twenty years, and for a very considerable time past the owners have been engaged boring through a whindyke of unknown depth. The venture has been crowned with success, for abundance of coal has been reached. The company are about to erect plant to maintain at first a 2000 tons daily output, while two other collieries are at once to be opened, meaning the employment of a couple of thousand miners. Practically a village will at once require to be erected for housing the men in both Prestonpans and Cockenzie.

It is announced that the South Staffordshire Mines Drainage Commission are about to develop a scheme for unwatering the submerged coal mines of Staffordshire, or the "Black Country," as it is generally called. For a generation repeated attempts have been made to release the coal which is imprisoned underground in the neighborhood of Wednesbury. But all the labors of the commissioners have been in vain, so far, at least, as any addition to the coal supply of the district is concerned. Their pumping operations have barely sufficed to prevent the deeper mines from being more flooded, and thus placed finally beyond the reach of the collier's pick axe. It is argued by more than one expert that the coal is not worth the trouble of saving in these days of comparatively cheap fuel and abundant supplies, and that the enormous expense incurred in pumping off the water is sheer waste. None the less, I believe the Mines Drainage Commission intend spending £70,000 in the attempt to reclaim these flooded coal mines. The area within which the submerged coal is lying is situated between Wolverhampton and the river Stour, and has Walsall and West Bromwich upon its eastern borders. The towns most intimately concerned in the project are Wednesbury, Darlaston, Tipton and Bilston. At many of the pits hereabouts the upper workings are being rapidly exhausted, and it is becoming more and more important that the coal stored in the lower workings should be reached if possible. It is estimated that if the commissioners can prove successful, they will liberate somethink like 40,000,000 tons of coal.

A New German Commercial Treaty.

Correspondence is proceeding between the German and the British Governments relative to the conclusion of a new commercial treaty to take the place of that which is expiring. Endeavors were made in the Reichstag before it was prorogued last month to obtain from the Imperial Chancellor some statement on the subject, but this Count von Bulow declined to give. It would not appear that Germany is seeking certain advantages as far as both Canada and South Africa are concerned, but so far as the correspondence has yet proceeded, the British Government refuses, it is said, to commit the colonies in any way.

Petroleum in Roumania.

The Roumanian Finance Minister, in the course of a recent interview, stated that foreign capitalists desirous of investing money in Roumania will be assisted and advised by the Roumanian Government. The Finance Minister further stated that a pipe line will be constructed from petroleum fields to the ports of Cernavoda and Constantza, and for the study of this a sum of 500,000 francs has been voted. The construction of the pipe line itself will cost 10,000,000 francs, and this will be borne by the State, as it is not expected that the expenses will be covered for several years. This pipe line is confidently expected to enhance the value of the future petrolum industry of Roumania. At present difficulties of transport stand in the way of an expansion of this trade, but it is expected that once these difficulties are removed, Roumanian petroleum will find a ready sale. It is alleged that this petroleum contains more benzine than its American rival, and that it possesses a finer color and higher lighting power than the Russian petroleum.

Lift Wanted at Malta.

The Crown Agents for the Colonies report that sealed tenders will be accepted at the office of the Receiver General and Director of Contracts, Valletta, Malta, up to 11 a.m. on Friday, October 30, 1903, for the concession of the right to construct a lift from the Marina to the Upper Barracca, and to work the same for a period of either 60 or 99 years, together with a right to levy tolls and transit dues.

S. G. H.

On May 26 the stockholders of the South Baltimore Car Works, South Baltimore Foundry and Ryan & McDonald Mfg. Company, all of Baltimore, Md., met and voted in favor of merging their interests into a single corporation. A new company will be organized with a capital of about $1,000,000, which will probably be named the South Baltimore Steel Car & Foundry Company. While the plans of the new consolidation are not yet fully developed, it is understood that the promoters contemplate the erection of a steel car plant.

The Iron Age

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The Protection Movement in Great Britain.

Two weeks since we called attention to the fact that Mr. Chamberlain had taken a position in a speech at Birmingham, England, which showed that he was prepared to advocate a departure by Great Britain from her long established policy of free trade. In a sensational debate in the House of Commons, on May 29, the fact was brought out that the Prime Minister, Mr. Balfour, has been converted to Mr. Chamberlain's views on this question. The debate was brought about by an attack on Mr. Chamberlain's fiscal views by Sir Charles W. Dilke, a prominent member of the Liberal or opposition party. This appeared to make necessary a statement by Premier Balfour of his position. Mr. Balfour deprecated "waving the ragged moth-eaten flags of either the protectionist or the free trade side in the controversy, now as far removed as the poles from the controversy of half a century ago." He said that Great Britain must become more and more dependent on foreign countries for food, and owing to exterior tariffs would find herself compelled to dispose of her exports on onerous terms, resulting in an enormous loss to the country. He therefore urged that the time had come when it should be publicly discussed whether the doctrine that revenue was never to be raised except for purposes of expenditure must not be abandoned. The fiscal question, he said, required a most careful examination. At present Great Britain is the only free trade country in the world. If the prevailing tendency continued the time must come when the only neutral markets where she could dispose of her exports would be her own protectorates, her own crown colonies and India, leaving Great Britain helpless in the hands of her nations. With respect to tariff negotiations, if foreign countries were to be allowed to treat the British colonies as foreign nations, Great Britain would be forced by patriotic interests and regard for her colonies to retaliate. Canada, Australia, India and New Zealand were parts of the empire, and it was absurd that they should be treated as separate aggregations because self government had been given to them. If preference was given to imports from the colonies, they would in exchange mitigate the severity of their hostile tariffs against the motherland. It was not true that the idea was started by Mr. Chamberlain as a policy of his own and without consultation with his colleagues. He said that he was in agreement with Mr. Chamberlain. If this scheme, or some other similar scheme, was impracticable, the empire could not be brought to the same plane of fruition as had been the case in the United States.

Mr. Chamberlain addressed the House, expressing surprise at the fact that his speech at Birmingham on May 15 had aroused such attention. All the critics of his suggestions had fallen in error in supposing that a reversal of Great Britain's fiscal policy was involved. Nothing of the kind had been proposed. Everything depended on the definition of free trade, and if Cobden's definition, "to bring about a free interchange of commodities at their natural prices," was accepted, then neither he nor any member of the Government sought to depart therefrom. Although nothing was now suggested in the nature of a reversal of Great Britain's fiscal policy, it was certain that a mandate must be given the Government if the suggestions that he had thrown out were to be carried into effect. If there was to be any change in the fiscal system the country would have to give up all hope of closer fiscal relations with the colonies and must abandon all idea of securing at any time closer political relations with them. If the Government received a mandate it would produce a plan. He could call another colonial conference, but he could not negotiate with the colonies before the people had given the Government a mandate. Everything would depend upon what the country had to offer. In the first place, however, he must learn from every manufacturing district what articles made in those districts could be more largely sold if there were preferential rates in the colonies. What Great Britain should give was preference on great colonial products, and that preference would have to be on raw material, or on food, or upon both. The workingman's dislike to a tax on food had no terrors for him. He was prepared to go into the homes of the laboring men and argue the subject with them. If the opposition were able to show that it meant greater cost of living with no increase of wages, their position would be justified, but if he was able to show greater increase of wages than loss on food, then, said he, "I think I shall have a chance." "It was inevitable," he said, "if preferential duties were levied that a tax be placed on food stuffs, and as the working class would pay three-fourths of such a tax it was only fair that this money and the one-fourth paid by the rich class should be applied to social reforms, like old age pensions. Such a tax was not protective in intention, but, incidentally, it would be protective." If, he added, food were taxed in the future, it would not be an unmixed evil, because it would help the depressed industry of agriculture and increase Great Britain's home supply of food. More than that, it would enable her to deal with Germany in defense of Canada. Repeated representations had been made to Germany in regard to Canada, but he did not see what Germany could do to meet the British views until Great Britain was in a position to touch the pockets of the German people. Was it not also conceivable, asked Mr. Chamberlain, that Great Britain would have to defend her trade against unjust competition, such as that of the trusts of America and the Continent? At present Great Britain was the only open market in the world and therefore a general dumping ground. If dull trade comes, said he, the trusts will flood our markets and the markets in which we compete with iron and steel at prices that we cannot meet. "If that happens nothing will prevent the people from putting on a duty to protect our staple industry."

The British press, in their comments on this debate, regard it as having most important and far reaching consequences. Despite the illogical position taken by both speakers, in which they assume that action of the character which they indorse does not involve a departure from Great Britain's traditional policy of free trade, a movement of this kind would mean a complete reversal of British fiscal policy. That this view of the question is accepted by the British press is shown in the publication of a leading editorial by the London *Telegraph*, headed "Will America Retaliate?" The *Telegraph* analyzes the trade between Great Britain and the United States, showing that in 1901 the British exports to the United States amounted to $91,900,000, while America's exports to Great Britain were $540,000,000. The article declares that a tariff war with the United States is inconceivable, but that it would create such a financial and industrial crisis in the United States as has never been known. America's answer to imperial reciprocity, there-

fore, would not be retaliation, but an offer to trade under more favorable terms. Little attempt is made by the other great journals to discuss the intrinsic merits of Mr. Chamberlain's policy. Attention is rather directed to the possibilities of such a political revolution, which is calculated to effect a new cleavage of parties at home with developments abroad which cannot possibly be foreseen.

Such a momentous change as that indicated by the speeches of these prominent members of the British Government cannot of course be brought about immediately. It can only be done, as they intimate, through an appeal to the country and the election of a new House of Commons, after a campaign in which this issue will be fought out. So wedded to the dogma of absolute free trade have been the great leaders of thought in Great Britain, and so overwhelming hitherto has been the preponderance of sentiment in favor of this fiscal policy, that such a campaign would undoubtedly be more hotly contested than any through which the British electors have passed for many years. The supporters of free trade would undoubtedly argue that the departure from open ports would greatly disturb the enormous carrying trade which Great Britain now enjoys and which has made that country the clearing house for an enormous part of the world's merchants and manufacturers. It can be assumed that the shipping interests would be strongly arrayed against the adoption of any policy which would interfere with their freedom. Nevertheless, the manufacturing interests of Great Britain have for years suffered so seriously from the increasing competition by manufacturers in other countries that they will give their strong support to a measure which would not only secure them a better home market, but would at the same time open up tremendous possibilities to increased trade in colonial markets. Mr. Chamberlain would hardly have ventured to take such a bold position against the apparently permanent policy of Great Britain unless he had received assurances from very powerful influences that his position would receive their cordial and aggressive support. For years the patient attitude of Great Britain in keeping her ports open to products of other countries has been the subject of increasing wonder to the other nations of the world. The prestige of Great Britain as a manufacturing nation has been so seriously weakened, of course not wholly by her fiscal policy, but partly as a result thereof, that it has seemed to all careful observers that the time would surely come when there would be an awakening among her people and they would refuse longer to permit their country to be a dumping ground for all the world. We may therefore assume that while a considerable period will elapse before Mr. Chamberlain's new policy is adopted for the conduct of the British Government, yet it appears destined to come. The question for us to consider is what effect the adoption of such a policy will have upon the export trade of the United States.

As stated above, in the quotation from the London *Telegraph*, our exports to Great Britain are overwhelmingly in excess of our imports. The same is true with regard to our trade with the British colonies. Some of the colonies have for many years been most excellent markets for American manufactured products. If all the colonies should adopt a system of preferential tariffs, which would give British manufacturers great advantage over American manufacturers, our trade with them would undoubtedly be curtailed. The extent of the curtailment would of course depend upon the ability of our manufacturers to cheapen the cost of production so as to overcome such a handicap. This, however, might mean sacrifices not only of profits to manufacturers but of liberal remuneration to labor. The markets which we possess, it may be assumed, would not be given up without a most determined struggle.

On the other hand, the adoption of preferential duties on products imported into Great Britain from the colonies would very probably have serious effects on our exportation of breadstuffs, provisions and the raw materials of manufacturing industries, of which we are now such large producers. Canada, India and possibly Australia would be benefited at our expense by a preferential duty on wheat and other cereals. Our great exports of cotton, on which the looms of England now so largely depend, would be materially cut down in favor of Egypt and other countries now protectorates or colonies of great Britain, in which the production of that staple would be stimulated if our cotton should be discriminated against by a duty. Our export trade in copper would suffer to the corresponding advantage of Canada, South Africa and Australia. Our producers of lead would be similarly affected. In fact, this list might be extended indefinitely.

Regarding the question of the London *Telegraph*, as to whether this country would retaliate, it is too early to form any conclusion as to what this country might do. It would of course be assumed that the United States has so long maintained high protective duties, without regard to the interests of other countries, that it would be inconsistent on its part to propose any interference with the domestic policy of another country, even though most important trade relations should be seriously upset. That view, however, would imply that the statesmen of this country belonged to the *laissez faire* school of political economists. The history of this country has shown that, on the contrary, they are not inclined to let things drift, but whenever necessary they have not hesitated to take an aggressive position. A new problem such as this will unquestionably be treated in a new way.

The Copper Situation.

Skeptics in the copper trade have clung to doubts as to representations made concerning the volume of the business done in crude copper, accompanied by reports as to the great scarcity of the metal in this country. People with memories which reach back to 1900 and 1901 recall that the most vigorous denials were made of the statements that 16 and 17 cent copper was causing an accumulation in the hands of producers, and yet the course of events justified the most alarming of these reports. Yet in 1902 and early in 1903 consumers were assured that the huge stocks had been swept away clean, and that in the face of an increased production.

In spite of the low prices for copper prevailing during the greater part of 1902, as compared with the artificial high range of 1901, production was considerably greater, as will be observed from the following preliminary statement just issued by the United States Geological Survey:

	1901. Pounds, fine.	1902. Pounds, fine.
Lake Superior	156,289,481	170,609,228
Montana	229,870,415	269,707,024
Arizona	130,778,611	121,085,896
California	33,667,456	25,038,724
Utah	20,116,979	23,939,901
Colorado	9,801,783	8,422,030
New Mexico	9,629,884	6,614,961
Wyoming	2,698,712	1,539,228
Nevada	593,608	164,301
Idaho	480,511	200,000
South Dakota	753,510	200,000
Southern and Eastern States	6,860,039	13,599,047
Lead desilverizers	531,530	500,000
Totals	602,072,519	641,620,340

The production would have been even greater had it not been for a series of accidents. The Arizona output was curtailed by the fire in the United Verde, which cut off about 15,000,000 pounds, and by the troubles in Shasta

County, California, which reduced the production of the Mountain and Sully Hill mines by about 10,000,000 pounds. In Montana, however, the Amalgamated group did very much better, while on Lake Superior the Champion and Trimountain mines appeared as new producers, and the Baltic, Wolverine, Isle Royale, Franklin and Mass mines increased. This was partly offset by a smaller yield from the Quincy, Calumet and Hecla and Tamarack mines. In Arizona the Shannon and Calumet. and Arizona entered the ranks of producers, and the Arizona Copper Company exceeded 30,000,000 pounds, as compared with a little over 20,000,000 pounds in 1902. In the South the Tennessee Copper Company got into full swing.

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In ore and matte, deducting re-exports, foreign, in transit	54,000,000	25,000,000
Bars and ingots	73,826,406	103,129,568
Totals	739,898,925	769,749,908
Exports:		
Domestic bars and ingots	194,249,828	354,668,849
Foreign bars and ingots	12,888,083	11,629,877
In ore and matte	15,000,000	12,500,000
Totals	222,137,911	378,798,726
Excess of supply	517,761,014	390,951,182
Stock	— 130,844,844	+ 126,348,645
Home consumption	386,916,170	516,951,182

The increase in the imports of bars is due to the change effected in Mexico of converting the matte locally by the Bessemer process. The export, it will be noted, was exceedingly large in 1902, so that we were forced to draw very heavily on the stocks.

The statistics show an enormous increase in the consumption from the year 1901, when the users of copper were starving themselves, to the year 1902, when they bought very freely, and when the requirements of the electrical industries grew at a tremendous rate. But the increase is not up to the estimates freely made in the copper trade, which place the consumption much higher. It is somewhat difficult to escape the conclusion, however, that the metal is tending into somewhat less favorable shape, even if it be admitted that the stock carried at the beginning of this year has been materially reduced during the past five months. The exports have fallen off and production has unquestionably increased, so that values may display a declining tendency.

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Railroad earnings like bank exchanges are important business barometers, although, like most statistical records, they lose interest to a people who live intensely in the to-day, or, more properly, have one foot in the to-morrow. They are of but passing interest to the speculator, who discounts all events, and even the investor makes use of them merely to verify his previous action based upon prior knowledge made possible by the complex, quick acting machinery of modern trade. These time honored returns, however, are not without considerable value to the majority of people as offering reliable data as to the status of internal commerce, their principal function being of a historical character. Time is an important element in the preparation of these statistics necessarily, especially the net results.

The prosperity and prospects of railroad interests at present, too, bear a closer relationship to other commercial currents than usual, and in larger measure other industries are dependent upon the efficiency of the transportation service. Hence whatever happens to influence railroad earnings and prospects assumes a more important position in the eyes of the public.

For several months up to March the greatly increased gross earnings of the railroads had been absorbed by the enormously increased operating expenses, but during March returns from 107 roads, as made to the *Financial Chronicle*, showed a gain of over four and one-half million dollars in net earnings. But the gross earnings in March were unusually large, over fourteen and one-half million dollars. Returns from even a greater number of roads for the full first quarter of the year, however, are more startling than the monthly returns in revealing a gain of over forty-two million dollars in gross, while the net earnings increased considerably less than seven million dollars, showing that operating expenses increased over thirty-five million dollars in three months—the total gross earnings for that period being over three hundred and fifty-five million dollars and the net earnings over one hundred and three million dollars. The higher wages paid to labor and the excessive prices paid for fuel are cited as the two principal causes of the increased cost of operating, but floods and freshets were responsible to some extent. Many, if not all, of the companies are still handicapped by high labor cost, but most of them have been relieved from the abnormal prices of fuel, all of which will be

Viewing the returns of the railroads in groups and to the iron

fore, would not be retaliation, but an offer to trade under more favorable terms. Little attempt is made by the other great journals to discuss the intrinsic merits of Mr. Chamberlain's policy. Attention is rather directed to the possibilities of such a political revolution, which is calculated to effect a new cleavage of parties at home with developments abroad which cannot possibly be foreseen.

Such a momentous change as that indicated by the speeches of these prominent members of the British Government cannot of course be brought about immediately. It can only be done, as they intimate, through an appeal to the country and the election of a new House of Commons, after a campaign in which this issue will be fought out. So wedded to the dogma of absolute free trade have been the great leaders of thought in Great Britain, and so overwhelming hitherto has been the preponderance of sentiment in favor of this fiscal policy, that such a campaign would undoubtedly be more hotly contested than any through which the British electors have passed for many years. The supporters of free trade would undoubtedly argue that the departure from open ports would greatly disturb the enormous carrying trade which Great Britain now enjoys and which has made that country the clearing house for an enormous part of the world's merchants and manufacturers. It can be assumed that the shipping interests would be strongly arrayed against the adoption of any policy which would interfere with their freedom. Nevertheless, the manufacturing interests of Great Britain have for years suffered so seriously from the increasing competition by manufacturers in other countries that they will give their strong support to a measure which would not only secure them a better home market, but would at the same time open up tremendous possibilities to increased trade in colonial markets. Mr. Chamberlain would hardly have ventured to take such a bold position against the apparently permanent policy of Great Britain unless he had received assurances from very powerful influences that his position would receive their cordial and aggressive support. For years the patient attitude of Great Britain in keeping her ports open to products of other countries has been the subject of increasing wonder to the other nations of the world. The prestige of Great Britain as a manufacturing nation has been so seriously weakened, of course not wholly by her fiscal policy, but partly as a result thereof, that it has seemed to all careful observers that the time would surely come when there would be an awakening among her people and they would refuse longer to permit their country to be a dumping ground for all the world. We may therefore assume that while a considerable period will elapse before Mr. Chamberlain's new policy is adopted for the conduct of the British Government, yet it appears destined to come. The question for us to consider is what effect the adoption of such a policy will have upon the export trade of the United States.

As stated above, in the quotation from the London *Telegraph*, our exports to Great Britain are overwhelmingly in excess of our imports. The same is true with regard to our trade with the British colonies. Some of the colonies have for many years been most excellent markets for American manufactured products. If all the colonies should adopt a system of preferential tariffs, which would give British manufacturers great advantage over American manufacturers, our trade with them would undoubtedly be curtailed. The extent of the curtailment would of course depend upon the ability of our manufacturers to cheapen the cost of production so as to overcome such a handicap. This, however, might mean sacrifices not only of profits to manufacturers but of liberal remuneration to labor. The markets which we possess, it may be assumed, would not be given up without a most determined struggle.

On the other hand, the adoption of preferential duties on products imported into Great Britain from the colonies would very probably have serious effects on our exportation of breadstuffs, provisions and the raw materials of manufacturing industries, of which we are now such large producers. Canada, India and possibly Australia would be benefited at our expense by a preferential duty on wheat and other cereals. Our great exports of cotton, on which the looms of England now so largely depend, would be materially cut down in favor of Egypt and other countries now protectorates or colonies of great Britain, in which the production of that staple would be stimulated if our cotton should be discriminated against by a duty. Our export trade in copper would suffer to the corresponding advantage of Canada, South Africa and Australia. Our producers of lead would be similarly affected. In fact, this list might be extended indefinitely.

Regarding the question of the London *Telegraph*, as to whether this country would retaliate, it is too early to form any conclusion as to what this country might do. It would of course be assumed that the United States has so long maintained high protective duties, without regard to the interests of other countries, that it would be inconsistent on its part to propose any interference with the domestic policy of another country, even though most important trade relations should be seriously upset. That view, however, would imply that the statesmen of this country belonged to the *laissez faire* school of political economists. The history of this country has shown that, on the contrary, they are not inclined to let things drift, but whenever necessary they have not hesitated to take an aggressive position. A new problem such as this will unquestionably be treated in a new way.

The Copper Situation.

Skeptics in the copper trade have clung to doubts as to representations made concerning the volume of the business done in crude copper, accompanied by reports as to the great scarcity of the metal in this country. People with memories which reach back to 1900 and 1901 recall that the most vigorous denials were made of the statements that 16 and 17 cent copper was causing an accumulation in the hands of producers, and yet the course of events justified the most alarming of these reports. Yet in 1902 and early in 1903 consumers were assured that the huge stocks had been swept away clean, and that in the face of an increased production.

In spite of the low prices for copper prevailing during the greater part of 1902, as compared with the artificial high range of 1901, production was considerably greater, as will be observed from the following preliminary statement just issued by the United States Geological Survey:

	1901. Pounds, fine.	1902. Pounds, fine.
Lake Superior	156,289,481	170,609,228
Montana	229,870,415	269,707,024
Arizona	130,778,611	121,085,896
California	33,667,456	25,038,724
Utah	20,116,979	23,939,901
Colorado	9,801,783	8,422,030
New Mexico	9,629,884	6,614,961
Wyoming	2,698,712	1,539,228
Nevada	593,608	164,301
Idaho	480,511	200,000
South Dakota	753,510	200,000
Southern and Eastern States	6,860,039	13,599,047
Lead desilverizers	531,530	500,000
Totals	602,072,519	641,620,340

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County, California, which reduced the production of the Mountain and Sully Hill mines by about 10,000,000 pounds. In Montana, however, the Amalgamated group did very much better, while on Lake Superior the Champion and Trimountain mines appeared as new producers, and the Baltic, Wolverine, Isle Royale, Franklin and Mass mines increased. This was partly offset by a smaller yield from the Quincy, Calumet and Hecla and Tamarack mines. In Arizona the Shannon and Calumet. and Arizona entered the ranks of producers, and the Arizona Copper Company exceeded 30,000,000 pounds, as compared with a little over 20,000,000 pounds in 1902. In the South the Tennessee Copper Company got into full swing.

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Viewing the returns of the railroads in groups

significant fact is brought to light—namely, that the gains in net earnings during March were largely monopolized by three groups—the coal roads, the trunk lines and the Southern railways—all other groups showing relatively small increases. And this feature is emphasized in the returns for the full quarter, in which it is shown that the anthracite coal roads accounted for over four and one-half million dollars of the total net gain of six million seven hundred and eighty-six thousand dollars; and of the remainder, the Southern roads contributed nearly one million three hundred thousand dollars. There is a belief among the ill informed that railroads will be able to purchase iron and steel in the coming months—assuming that current prices are high—at lower prices. Such a belief is based upon an erroneous assumption, and it should be recalled that transportation companies have purchased steel rails, for several years, at several dollars per ton less than they have sold old rails fit for relaying. Possibly bar iron may be contracted for at lower prices, but the roads now are receiving several dollars per ton less for the old material they market than for many months.

Irrigation as a Factor in National Development.

It is doubtful if many persons who have not had opportunities of learning from personal observation what irrigation means for areas of many thousand square miles of now arid country appreciate either the magnitude of the problem which is now engaging the attention of the Department of Agriculture or its importance in its relation to the future development of this country. The discussion which at one time raged fiercely as to whether this work should be left to private enterprise or whether by reason of its magnitude it properly devolved upon the Government of the United States has now only academic interest, at most. Gradually it has assumed the character of a public work of magnificent proportions and incalculable ultimate advantage to the country, and its interest is sufficient to warrant a statement of the essential facts.

Several years ago it became evident that most of the public lands upon which crops could be profitably grown, if at all, without artificial assistance in superficial irrigation had been taken up. The area not available for development by individual enterprise is estimated by the Secretary of Agriculture at about 500,000,000 acres. This is some 25,000 square miles greater than the area of Mexico. With a population of the average density of the United States this territory would accommodate about 20,000,000 people. If populated as densely as Massachusetts it would hold about 276,000,000, or nearly three times the entire population of the United States, as shown in the census of 1900. It represents something like one-fourth the area of the United States, exclusive of Alaska. Much of it is naturally rich and fertile, and practically all of it is deemed capable of utilization for crop raising and grazing if irrigated by the distribution of impounded surface water or by the expedient of artesian wells.

After most of the public lands in the districts watered by natural distribution had been taken up immigration began to diffuse itself over the arid lands, where the right of acquisition under the pre-emption, homestead and timber laws still existed. The efforts of these people to overcome the difficulties which nature has placed in the way of easy development have excited the sympathies of right minded citizens who have seen the struggle in ...ess and noted the hard conditions under which it ...n conducted. One good season in which rain was ...ntiful would bring multitudes of home seekers to the arid plains, full of hope and courage. A very large number of brave efforts to grow crops without more water than nature furnished normally have had to be abandoned, and the area of land once cultivated but now tenantless can only be estimated. What had been accomplished in Utah was convincing, but to imitate it was possible only where more wealth existed than home seeking settlers brought with them or had been able to win from their unremunerative and disappointing labors. By private enterprise some 7,500,000 of acres were reclaimed by simple but necessarily costly expedients in hydraulic engineering. The work was then undertaken in a larger way, and probably some $200,000,000 have been invested by corporations in irrigation plants. It soon became evident, however, that nothing like a comprehensive and systematic development of irrigation could be counted on to result from this method, one effect of which was to encourage the acquisition for speculative purposes of sources of water supply and sites for dams under the belief that they would ultimately become of large value. Rights thus secured were not always developed, and their possession placed a check upon legitimate enterprise, since those who held such rights would not part with them unless paid bonuses so high that from the business point of view irrigation became impracticable.

The problem has been admirably solved by the existing law, less than one year in operation and known as the Newlands Irrigation act, taking its very appropriate name from its author, Representative Newlands of Nevada, one of the first of the silver advocates to recognize that the cause of bimetallism on the basis of an arbitrary ratio between gold and silver was lost and to turn his energies to the accomplishment of something of tangible value to the district he represented and others like it. This act provides that the income from the sale of public lands shall be set apart in the Treasury as a separate account, known as the Arid Land Reclamation Fund. It will be swelled from the proceeds of the sale of mining, timber and stone lands, as well as of the arid lands themselves. Judging from the experience of the past three years it should average about $3,000,000 per annum. From the fund thus accumulated the Secretary of the Interior may draw the cost of constructing the irrigation works agreed upon for the reclamation of arid lands. He is authorized to make contracts for such undertakings up to the amount of the fund in the Treasury and unappropriated. To start the work the proceeds from the sale of public lands for the two years preceding the passage of the Newlands act were made available for this purpose, thus permitting immediate undertakings to the cost of $6,000,000.

The most interesting feature of this plan is that no part of the expenditure of the Government for irrigation is a gift to the settler. Each project undertaken is automatically self sustaining. Under each contract undertaken by the Secretary of the Interior the settlers who avail themselves of the advantages created are obliged to pay into the fund, in ten equal installments, such proportion of the cost of the irrigation plant as may be assessed upon the land they take up. It is estimated that in this way a constantly accumulating fund of from $3,000,000 to $10,000,000 will become available to carry forward the work. In framing the law, which is properly regarded as one of the most admirable of Congressional enactments, every care was taken to guard against land monopoly and to reserve the areas reclaimed for actual settlers. It provides among other things that no right to the use of water for the irrigation of land in private ownership shall be sold to any one owner for an area exceeding 160 acres; that no permanent title to irrigated land shall be conveyed until all payments thereon shall

have been made, and that no transfer of title by sale or gift shall be recorded unless the person in whose interest such transfer is executed is an actual resident on such lands or occupies immediately contiguous property. This law was enacted on the assumption that within the next 30 years under its operation there will be reclaimed for cultivation not less than 100,000 square miles. This does not include any part of the land which, lying outside of, but contiguous to, the irrigated areas, will admit of much more ample utilization than is now possible for grazing purposes. The total amount of money to be spent in this work during the next 30 years is estimated at $150,000,000, not a dollar of which will be raised by taxation. Naturally, what appear to be the easiest problems in irrigation are those to be first attacked, and in the plans for the reclamation of the 100,000 square miles referred to no difficulties are expected to be encountered. It may be assumed, however, that as the success of these plans is assured other and bolder schemes will be undertaken which may result in changing the whole character of the Great Basin. To partially restore Lake Booneville is an engineering possibility, and another half century may find it a necessity. The commercial significance of such an increase in the habitable area of the world, with an environment of the highest and most uniformly developed civilization ever known, cannot very well be overestimated.

Influence of Self Hardening Steels on Machine Tool Design.

It was only a few months ago that the new self hardening steels were introduced and their reliability as metal removing tools was established. As soon as workers in metal were convinced of the fact that these tools were capable of larger cuts at greater speeds than any of the well-known tool steels, and also that their life between sharpenings was considerably longer, they were confronted with the problem how best to utilize the advantages presented. To avail themselves of all the benefits they had to provide for high cutting speeds, increased feeds and greater depths of cut. It was evident that radical measures were necessary. There appeared to be but two ways of accomplishing this, only one of which could be immediately adopted by the manufacturer. He could increase the speed of his main line shaft and by this means bring into service the larger steps of his cones and his back gears—all of these of course at higher speeds.

This was done at the works of the Bethlehem Steel Company, where the line shafts were speeded from 90 to 250 revolutions per minute, and further changes were made in the countershafts to speed up individual machines. The greater speeds, feeds and cuts thus obtained resulted in the removal of 137.3 pounds of metal per hour in 1900 as against 31.18 pounds in 1898, or a gain of 340 per cent. But this added power taxed most of the machines beyond their strength and change in drives became imperative. Other manufacturers went through the same experience and soon found that their machine tools were not calculated to stand the strains due to operating the new steels at their greatest efficiency.

In order to obtain permanent relief it was essential to have recourse to the alternative referred to above and apply direct to the builder of the tools. Our columns during the past few months have shown to what extent standard machine tools have been changed in design in order to meet the new requirements. The alterations made in lathes may be taken as representative of all the other standard tools intended for the quick and rough removal of large quantities of metal. We have described many of these tools which have been reconstructed solely with the object of handling self hardening steels. In each case the beds have been vastly strengthened, the gears widened and in some instances made of steel instead of iron, and the cone steps have been widened. In a word, the entire machine has been re-designed solely to provide the strength needed. This movement, now that it has fairly begun, will undoubtedly influence all tools intended for heavy work and in the end accrue to the advantage of those who have to remove metal *en masse*, as it were.

It has been suggested that the change now taking place may be felt in the case of tools which have so long been used both for roughing and finishing. The new designs are adapted for reduction in large quantities and the question of refinement in their design is absent, and very properly so. But will the use of the new steels cause a complete separation of the work of roughing and finishing and cause the two operations to be always performed—in comparatively large work—separately? Is it likely that the influence, too, will extend to tools built for both heavy work and accuracy by either increasing or diminishing the former without in any way sacrificing the latter? Time alone will tell, but it is sometimes interesting and always dangerous to speculate on what may happen.

It might be well if designers of yachts intended for ocean racing would take a leaf from the creed of the bridge engineer. Both have to do with wind pressures and strength of materials, and both work for cash that others may get somewhere and get there quick; but the first also works that others may have sport. "Shamrocks II and III" lost their masts during preliminary trials; "Columbia" was disabled during a race; "Constitution" is the latest on the list, with the loss of her topmast a few days ago. The engineer has what he calls "factor of safety," known among the vulgar as "factor of ignorance." Not being confident of the integrity of his material he uses more than his calculations call for, sometimes two, three or five times as much, according to conditions. The yacht designer does not appear to have any factor of this description in his book. He works close to the limit, and his boats are disabled. If bridges were to fail in the same proportion as these boats do the bridge engineer would be mobbed, speedily and effectively.

CORRESPONDENCE.

The Working of Titaniferous Magnetite.

To the Editor: In the issue of your magazine of April 2, on page eight, I notice a communication from "D. E. W." as to the working of titaniferous magnetite, which article in its every line breathes of predjudice too apparent to be concealed even from those who may be ignorant of the facts which the contributor so greatly mistakes.

Will you permit me the privilege of stating the facts and of correcting the false impressions created by the wholly unwarrantable article referred to?

The Johnson Nickel Mining Company of St. Paul own over 7000 acres of lands in Cook County, on which are found deposits of the titaniferous iron ore. Some of these lands have been developed by the company by diamond drilling, and millions of tons of ore have been thus brought to light. The company have spent thousands of dollars in this work and to their efforts, their enterprise, their large expenditure and their chemical investigations, is principally due the present knowledge of the valuable deposits of that region. Their methods of procedure have been somewhat "notorious" only in this, that they have used their own money in paying all of their bills in thus obtaining information which will be worth millions to them and to this State and to the iron

interests of the nation. For years the leading iron masters of the country have claimed that these titaniferous ores were too refractory to be of any value, and that the Cook County deposits were therefore of no use. On that account those vast and valuable deposits have gone begging while millions have been made out of the inferior ores of the western ranges.

The "notorious" methods of the Johnson Company in persistently claiming value for their holdings and in pouring their money out in an effort to prove it have now borne fruit in the sudden creation of an almost unbounded interest in that heretofore neglected and condemned region, and in directing to it the calm, critical consideration of the leading iron interests of the country. Desiring recently to make a test as to the smelting of the ore, the company had about 6 tons of loose surface ores hauled by dog team from their Tucker Lake properties to the Canadian Northern Railway, a distance of only 6 miles.

Navigation on Lake Superior being then closed, the Johnson Company went to many hundred dollars of expense in having this small lot of ore shipped to Port Arthur and thence to St. Paul by way of Winnepeg (and along a circuitous route). On April 12 a part only of the ore was smelted in an ordinary cold blast cupola of the Valley Iron Works of St. Paul. Such a furnace, as you will understand, is not intended for the reduction of ores, but only for foundry purposes. Common lime and coke were used as a flux and no other substances were introduced, nor was the charge subjected to any special treatment or process, as was extensively advertised by misinformed correspondents, and for which the company are not responsible. Let me state emphatically that the company does not claim any secret process. Notwithstanding the fact that the furnace was not suited to the purpose and that only ordinary methods were used, the results were astonishing and proved beyond all question that Cook County refractory titaniferous ores can be successfully treated by ordinary methods, even in the absence of ordinarily favorable conditions.

The test was witnessed by many men from Duluth and elsewhere, who are interested in the iron business and in Cook County ore deposits, and all were a unit in praising the results. The product coming directly from the furnace was run into bars having a grain as fine as that of tool steel and taking as fine a polish as can be given to the finest steel. Its appearance was that of steel and the best judges pronounced it to be equal in quality to steel.

Analyses of this steel pig show it to be sufficiently low in sulphur and phosphorus and to contain both chrome and vanadium in highly valuable percentages. Heretofore it has been assumed that the vanadium known to be present in the ore would, in the process of smelting, go off with the slag, but the analyses show that this assumption is unwarranted, for that most valuable alloy remains in the iron. By the way, the Johnson Company, through the instrumentality of Dr. N. Lehnen, a St. Paul chemist, made the discovery of the presence of vanadium in that ore. For a long time its presence in the ore was contested by such parties as "D. E. W." represent, but later they conceded it was there, but that it would run off in the slag. The smelter test referred to proves conclusively that it stays with the iron. The tests show also that the titanium is almost entirely eliminated from the metal. The tests were not on as large a scale as would be desirable, but, even such as they were, they have greatly strengthened the position of the Johnson Company and put them another step forward and have done much for the future iron industry of this State, and the company deserve commendation for proving a new iron field for Minnesota, rather than prejudicial insinuation for their open handed efforts which "D. E. W." has seen fit to brand as "notorious methods."

W. P. Butler.

Minneapolis, Minn., May 29, 1903.

Methods of Some French Tool Steel Makers.

To the Editor: Your editorial article in *The Iron Age* of May 14 under the above title was noticed by us and read with interest. We have had a rather unpleasant experience with a French company manufacturing tool steel. Their agent called on us somewhat over a year ago and offered to sell us some tool steel and give a written guarantee regarding its quality. We gave him a trial order. It was not our experience to receive more steel than ordered, but on receipt of the steel it proved to be of a very inferior quality. The manufacturers have up to this time refused to acknowledge themselves bound by the agent's guarantee regarding the quality, and advise us that they are proceeding to collect their account against us in court. We do not think that they can collect this, but of course it is disagreeable to be obliged to defend the suit.

Manufacturer.

Boston, May 29, 1903.

The Baby Converter.

To the Editor: In your issue of May 22, 1902, you gave an account of the meeting of the Mining Engineers in Philadelphia. I quote all that relates to me in that number: "H. H. Campbell held that the claim that the baby Bessemer converter produces exceptionally hot steel is fallacious. The open hearth furnace can readily meet the requirements as to hot steel. The trouble is to keep it cool enough."

Your correspondent, Mr. Deemer, has a perfect right to question my statements, either in this quotation or in my later book, but he has no right to state the matter incorrectly, as he does state it in the opening lines of his communication.

H. H. Campbell, General Manager.

Steelton, Pa., May 27, 1903.

To the Editor: The letters appearing in *The Iron Age* in reference to the "baby" converter have interested me exceedingly. Some years ago I was assistant to the superintendent of the open hearth furnaces of the Cambria Iron Company and had much to do with steel castings. At that time considerable was said about the South as a producer of iron and steel, and I was given charge of a "baby" converter at Chattanooga and made the first Bessemer steel manufactured in that section.

It was found impossible to procure raw material for Bessemer steel, and after using English iron at $24 per ton the effort was abandoned. Otherwise the success of the "baby" converter, with the rudest of appliances, was surprising. The effort was to make blooms or slabs for nail plate by casting into narrow molds without using a blooming or cogging mill. These thin ingots were cast without "bootlegs," or piping, by controlling the casting temperature, so that when the ladle was emptied small patches of steel were seen cooling on the bottom of the ladle. This indicated that the steel had been poured at a low temperature, and the cast was quiet and the ingots were perfect. When good pig iron was used the steel was very soft and pure, and the mill boys would make chains of the cut nails made from this steel, bending the nails into little links without fracture.

The writer made steel castings very successfully from this converter, a double crank shaft for a spike machine being a particularly nice casting.

This little plant had no laboratory and almost none of the facilities of a steel mill, dependence being largely upon observation, judgment or guesswork.

Since then the writer has always felt a keen interest in the "baby" converter and has believed that it might be very useful in the manufacture of steel castings, and hence is glad to see this matter discussed.

Walter Graham.

Philadelphia, Pa., June 1, 1903.

Waterbury, Conn., presents a good example of new manufacturing building plans given up because of the general condition of labor. A number of large concerns had definitely planned to build this season until the labor situation had unfolded itself. Among them are the Waterbury Mfg. Company, the Benedict & Burnham Mfg. Company, who are adding furnaces to their brass casting shop, which are minor additions compared with the scheme of improvements mapped out and later aban-

doned; the Bristol Company, who had intended a new building for their electrical department and a new office building, and Blake & Johnson, who had planned to enlarge their machine shops. The Coe Brass Company of Torrington had also planned considerable additions, which have been abandoned because of the general condition of business.

Trade Publications.

Machine Tools.—A catalogue has been received from Hill, Clarke & Co. of Boston, describing the extensive line of machine tools handled by them. It covers engine lathes, turret lathes, pipe machines, boring, drilling and milling machines, planers, shapers, keyway cutters, slotters, single, multiple and sensitive drills, gear cutters, grinding machines, &c. The catalogue is very handsomely gotten up, the halftones being excellently printed on super calendered paper, and each machine is covered by tables of dimensions, giving the various sizes and most essential details.

Fans.—We have received from the Garden City Fan Company of 42 South Clinton street, Chicago, Ill., a comprehensive catalogue of their ventilating and exhaust fans, pressure and positive blowers, hot blast apparatus, &c. The induced draft or vacuum method of operating boilers is introduced as a direct substitute for the chimney, creating a vacuum in the furnace from which the flue gases generated in the process of combustion are exhausted. The inlet or suction side of the fan connects with the boiler breeching, the hot flue gases being drawn through the fan and discharged into the stack or into a short pipe carried to a suitable hight above the boiler house roof. The apparatus is entirely independent of wind and weather and all other conditions which ordinarily affect natural or chimney draft. The speed of the fan can be regulated automatically to suit the requirements, and the first cost is much less than that of a brick stack. The company also supply direct draft when called for.

Pneumatic Riveters.—The General Pneumatic Tool Company of Montour Falls, N. Y., have prepared two pamphlets describing their column riveting machine and combined stationary and portable pneumatic riveter. The first differs from all other riveters in that it will head the rivet inside the column. By this method the difficulty of inserting the rivets through several thicknesses from the inside of the column is avoided. They are inserted from the outside, leaving, of course, the natural head outside. The riveter die is then placed over the head of the rivet, both being outside of the column and in plain sight, where rapidity and precision in handling the machine are possible. The riveter forms the head inside the column by an upward stroke of the stake die. Any tendency of the rivet to bend while being upset does not affect the alignment of the column, since the portion of the rivet which passes through the lattice bars is practically undisturbed and the holes in the lattice bars are perfectly concentric with the holes in the channel.

Fuel Economy and Smoke Prevention is the title of a handsome catalogue issued by the American Stoker Company, 277 Broadway, New York. This stoker consists of a special screw conveyor driven by a motor, which conveys the coal from a hopper outside of the furnace into a retort inside of the furnace. The incoming coal forces the coal in the retort upward into the fire, over tuyeres or air blocks, through which the requisite amount of air is introduced at the point where the most air is needed—that is, at the point where the coal bed is thickest. It will be seen from this that the principal characteristic of this stoker is that it feeds the coal continuously into the furnace from below or by a continuous under feed as opposed to intermittent or hand firing methods. The results of this method are the absence of smoke, a continuous distribution and most economical consumption of coal, the maintenance of uniform conditions in the furnace and boiler, with a material saving in expense, and also that it permits of the use of cheaper coal than can be utilized by hand firing.

Points on Packing is the title of a small pamphlet by Jenkins Brothers, 71 John street, New York. This deals only with unvulcanized sheet rubber packing, which was originated by this concern over 25 years ago. The ideal packing must have sufficient strength to prevent its squeezing or blowing out when used between two flat surfaces, and at the same time be soft enough to fill up any roughness or unevenness in the surface. It must be flexible enough to bend easily in order to accommodate itself to irregular surfaces. It must be lasting. When once made it must stay made and not have to be watched continually. A packing that would harden and become as part of the joint would seem to fulfill the last conditions. Vulcanization is the result of heat and pressure, therefore, a properly unvulcanized packing subjected to the pressure needed to fasten a pair of flanges or other flat surfaces together, and the temperature of the steam passing through them, must necessarily vulcanize or harden and form a permanent joint. This is just what happens when the Jenkins' '96 packing is used. It hardens without becoming brittle and forms a joint as though ground in.

The "Hornsby-Akroyd" oil engines, built by the De La Vergne Refrigerating Machine Company, foot of East 138th street, New York, are fully illustrated and described in their late catalogue. In the use of these engines no ignition tube and no battery or spark coil are required. In this case the ignition is caused simply by the heated walls of the vaporizing chamber and by the heat due to compression. This method is entirely automatic and is absolutely reliable. No lamp is required except for starting, and there are no delicate mechanisms to adjust. The builders recommend the use of 150 degrees water white kerosene oil, but oils up to 300 degrees flash point, as well as crude oil and fuel oil, have been used successfully. Over 10,000 of these engines are now used.

"Ironscrap" Telegraph Code.—George Cohen Sons & Co., iron merchants of 600 Commercial Road, E, London, have issued a revised edition of their well-known "Ironscrap" Telegraph Code. The volume is a large one in its way, running to 255 pages, the code itself covering almost every conceivable shape and size of iron and steel goods, and covering at the same time every figure up to £250,000 sterling. Calendar, dimensions, weight, percentages, &c., are all included. As this firm have American connections, it is advisable that they should know without delay that the new "Ironscrap" book has been issued. The price is £2 2s., and can be obtained from George Cohen Sons & Co. or from the publishers, Effingham, Wilson & Co., 11 Royal Exchange, London, E.C.

Gasoline Carriage.—We have received from the J. Stevens Arms & Tool Company of Chicopee Falls, Mass., an illustrated catalogue which thoroughly explains the construction and the method of operation of a Stevens-Duryea gasoline carriage. The entire mechanism of this carriage is extremely simple and its operation safe and reliable.

Universal Saw Table.—The Brown & Zortman Machinery Company of Pittsburgh, Pa., have prepared a catalogue of the universal saw table built by the Colburn Machine Tool Company of Franklin, Pa. This machine is strictly universal in its character, and being the product of a plant splendidly equipped for the building of machine tools, naturally has the same essential features that characterize an up to date metal working tool. This includes a careful distribution of the metal and a liberal use of the same where needed. The main frame of the machine is very massive and heavily ribbed, thus eliminating any tendency to vibration, which is common to most machines of this type. All running bearings, studs, pins, &c., are ground on dead centers and are as true as is possible to make them. All the parts are made interchangeable.

Spiral Riveted Pipe.—The American Spiral Pipe Works of 1173 S. Paulina street, Chicago, Ill., are now making spiral riveted pipe in sizes from 3 to 40 inches in diameter. Since this company use the best steel obtainable (of a tensile strength from 60,000 to 70,000 pounds), they furnish a pipe of a higher bursting pressure in the different gauges than has heretofore been obtained. This pipe is thoroughly protected by asphalt coating or galvanizing. Experience has shown that asphalt coated steel pipe of the same thickness as those here used has lasted from 25 to 40 years without any sign of decay. This pipe is specially adapted for intake mains, supplying water works, distributing mains and hydraulic pipe lines.

The Allis-Chalmers Company of Chicago, Ill., have issued a partial list of users of the Reynolds-Corliss engines which deserves attention because of its unique arrangement. First, the States and cities are arranged alphabetically with page references, which give the kind of engine there used. This is followed by a list of electric railway and lighting plants, together with the cylinder diameters and stroke. Then follow in order blowing engines, air compressors, pumping engines, rolling mill engines, flour mills, elevators, mines and foundries, machine shops, &c. In addition are enumerated saw mill engines, wood working shops, cotton and woolen mills, sugar and oil mills, paper mills, breweries, brick plants and newspaper and printing offices.

A very complete catalogue has been received from the American Blower Company of Detroit, Mich., describing several patterns of their "A B C" exhaust fans. These are intended for the removal of shavings and dust, elevating and distributing of cotton and wool, removal of smoke and fumes and for use in connection with special heating and drying plants.

A catalogue has been received from the Williams Patent Crusher & Pulverizer Company of St. Louis, Mo., describing their crushers and pulverizers for ore, rock, coal, &c. These machines are made in several sizes and capacities and are simple in construction and exceedingly durable and effective in operation.

OBITUARY.

EDMUND P. DWIGHT.

Edmund Parsons Dwight, president of the Chester Steel Castings Company of Chester, Pa., died suddenly at his home, Sunset, Chestnut Hill, Pa., on Sunday, May 24, aged 88 years. Mr. Dwight was of New England origin, a direct descendant of John Dwight, who settled in Dedham, Mass., in 1634, and son of Jonathan Dwight of Belchertown, Mass. He was born on November 23, 1815. After the completion of his education he became a planter in Louisiana, whence, about 50 years ago, he went to Philadelphia. For many years he was president of the Chester Steel Castings Company. Mr. Dwight was greatly interested in philanthropic and religious work, and was a generous supporter of many charitable and educational institutions. He is survived by a son and daughter.

NOTES.

ANDREW J. HISCOX, for 50 years a file manufacturer, died very suddenly at his shop at Worcester, Mass., Saturday, May 23, of apoplexy.

JOSEPH VAN VLECK, a former member of the metal firm of Phelps, Dodge & Co., of New York, died on May 25 at his home in Montclair, N. J., from heart disease, aged 73 years. Mr. Van Vleck was born in Dutchess County, N. Y., and came to New York in 1848. In 1879 he entered the firm of Phelps, Dodge & Co., with which he was connected for 23 years until his retirement from business a year ago. He was an officer and director of a number of mining and railroad companies in the Southwest, and was a well-known philanthropist.

AMOS C. BARSTOW, president of the Barstow Stove Company, and a director of the Builders' Iron Foundry of Providence, R. I., died very suddenly at his residence at Providence, Tuesday morning, May 12, from apoplexy. He was the son of Amos Chaffee Barstow, founder of the Barstow Stove Company. He entered the company's office when a young man, and became treasurer in 1869, holding the office until the death of his father, in 1895, when he was elected to succeed him as president. He was one of the prominent men of Rhode Island. He was a director of the Commercial National Bank and the City National Bank of Providence, and of the Slater Cotton Company of Pawtucket, R. I. He was vice-president of the old Providence & Springfield Railroad for several years, until the property was sold to the New England Railroad, in 1890. He had interests in several Western railroads. Mr. Barstow was born in Providence on November 2, 1848. He leaves a widow, one son and two daughters.

HENRY A. LOZIER, ex-president of the Cleveland Bicycle Company, died suddenly of heart failure on May 26 at the Waldorf-Astoria, in this city, in the sixty-sixth year of his age. Mr. Lozier was born in Dearborn County, Ind. When the bicycle industry was in its infancy he entered the field by purchasing a sewing machine plant in Toledo, Ohio, and making bicycles there. He later established factories in other cities. As the industry declined he directed his energies to other lines. He was president of the Boulay Spectacular Art Company, president and director of the Standard Power Company and treasurer and director of the Louis Mfg. Company. He leaves a widow, one daughter and three sons.

WILLIAM WRIGHT, reputed to be the oldest engine builder in the United States, died on May 26 at his home in Brooklyn, N. Y., aged 85 years. He began engine building at Palmyra, N. Y., subsequently going to Rochester, N. Y., where he was successful as a constructor of rotary engines. He became superintendent for Corliss, Nightingale & Co., and while in their employ invented the rotative valve. Later he organized William Wright's Engine Works, in Newburg, N. Y., which were successful for a quarter of a century. Subsequently he lost his fortune, and since then had devoted himself to inventions in mechanics.

WILLIAM RUSSELL WARNER died at his home in Covington, Ky., May 12, after a short illness from acute Bright's disease, aged 48 years. He was born in Covington, and had been connected all his life with the iron business, starting when a boy in the commission house of William Means, in Cincinnati, Ohio. For ten years he was assistant superintendent of the Shelby Iron Company, Shelby, Ala., and later became superintendent of the Alice Furnaces of the Tennessee Coal & Iron Company at Birmingham, Ala. Subsequently he was connected with the Dayton Coal & Iron Company and Rogers, Brown & Co., but for the past ten years had been with Matthew Addy & Co. He was well known to all foundry men in the Middle West, and was generally esteemed for his high personal qualities.

LYMAN H. GOODNOW, president of the L. H. Goodnow Foundry Company of Fitchburg, Mass., died at his home in Fitchburg, May 23. He was 75 years old. He was born in Boylston, Mass., and began his manufacturing career in Worcester at the W. A. Wheeler foundry, where he was for a time a foreman. Afterward he was a foreman at the Washburn & Moen Works, and later engaged in business for himself as a pattern maker and a manufacturer of wire drawing machinery in Worcester. He went to Fitchburg in 1875 and engaged in the foundry business. In 1896 he incorporated his business, taking in his son, Arthur L. Goodnow.

PERSONAL.

Dr. R. Mullineux Walmsley, principal of the Northampton Institute of London, has returned home after a tour of study lasting over two months.

S. T. Wellman, president of the Wellman-Seaver-Morgan Engineering Company of Cleveland, and C. Ernst have gone abroad.

Karl Schneider, chief engineer of the Rombach Works of Lorraine, has returned home after a brief tour through this country. The Rombach Works have just placed a very large order for Nuernberg and Augsburg gas engines, including over 3000 horse-power for driving a Bessemer blowing engine.

R. F. Diserens, who has been connected with Hill, Clarke & Co. of Boston for several years, has accepted the position of sales manager of the Blaisdell Machinery Company of Bradford, Pa., manufacturers of air and gas compressors.

It is stated that John W. Gates will sail from Europe on June 10.

B. F. Jones of Pittsburgh has been elected a director of the People's National Bank of that city to fill a vacancy caused by the recent death of his father, who was one of the original directors of that institution. Mr. Jones has also been elected a director of the Pittsburgh Trust Company, succeeding his father, who was one of its heaviest stockholders. Mr. Jones has been a director of the Union Trust Company, Mellon National Bank and Union Savings Bank, all of Pittsburgh, for some time.

A complimentary dinner was recently tendered to J. C. Hobart of the Triumph Electric & Ice Machine Company at the Business Men's Club of Cincinnati by those who were on the Business Men's Excursion to New Orleans and other Southern points on the trip to the recent convention of the National Association of Manufacturers. In addition to many pleasing compliments Mr. Hobart was tendered a silver loving cup as a token of appreciation for his services rendered as the chairman of the General Excursion Committee.

Harry Doyle, formerly superintendent of the pipe mills of Spang, Chalfant & Co., at Pittsburgh, has resigned to become general manager of the new pipe and tube mills of the Susquehanna Iron & Steel Company, at Columbia, Pa.

J. F. Lewis has been appointed assistant superintendent of the Edgar Thomson steel works, blast furnaces and foundries of the Carnegie Steel Company, at Bessemer, Pa., succeeding Chas. E. Dinkey, recently made superintendent in place of Thomas Morrison, resigned. Mr. Lewis has been in the employ of the Carnegie Steel Company about 27 years, first in the capacity of machinist apprentice, then machinist, draftsman, assistant master

mechanic, master mechanic, and finally assistant superintendent. A. E. Maccoun has been made master mechanic, succeeding J. F. Lewis. Mr. Maccoun has been employed by the Carnegie Steel Company for about six years, coming to the Edgar Thomson Works from the Homestead Steel Works.

T. H. Marburg, who has for several years been connected with the New York office of Schuchardt & Schuette of Berlin, sailed for Europe last Thursday. Mr. Marburg will study conditions at the home office of the firm for several months preparatory to assuming charge of the New York office. E. Muller, who is connected with the Berlin office, is temporarily in charge of the New York office.

S. Taylor Wilson has just been elected president of Tippett & Wood of Phillipsburg, N. J. Mr. Wilson has been vice-president and chief engineer of the company.

The Pressed Steel Car Company of Pittsburgh, up to and including May 29, 1903, have made and shipped 100,467 cars, this being the actual number of cars which are in service to-day made by the company, and includes steel cars, as well as wooden cars for which steel under frames have been furnished. The company have for some time past shipped over 120 cars per day from their McKees Rocks and Allegheny plants, using in the manufacture of these cars from 45,000 to 50,000 tons of steel plates and other shapes per month. They expect to turn out 38,000 finished cars in 1903. Large orders for cars both wooden and steel have been received for early delivery, in addition to a large number of pressed steel body and truck bolsters, freight car and engine tender trucks, as well as other pressed steel specialties for wooden and steel cars.

The Manufacturers' Association of Pittsburgh, at a meeting held recently to discuss the trouble with the pattern makers who have been out on a strike for some time, adopted the following resolution, which they have addressed to the men: "That the Pattern Makers' Union and the men be notified that such of the men as were formerly in the employ of members of this association will be reinstated by such members at the old rate of wages, provided they report for work June 2; and all men who do not report for work on or before that date must remove their tools from the premises by noon of June 2."

At Pittsburgh last week the Morton Trust Company of New York City and the Pressed Steel Car Company of Pittsburgh filed a bill in equity against the Standard Steel Car Company in the United States Circuit Court. The new case alleges infringement on the part of the defendant company, of a patent for a "combined stake and pocket for cars," granted to Edward W. M. Hughes of Chicago in 1889, and which, by assignment, came into the possession of the plaintiff car company, who subsequently assigned it to the Morton Trust Company as collateral for a certain loan. An injunction restraining further manufacture of the device by the defendant company, and damages are asked.

T. J. Shaffer, president of the Amalgamated Association, is sending out notices to the tin plate lodges to the effect that by personal negotiation and arrangement with officials of the American Tin Plate Company, there will be no rebate money kept back from June 1 until further notice. It is stated that the employees of tin plate mills will be notified when the 3 per cent. from their wages is to be again deducted.

George A. Eagles of Lancaster, Pa., traveling salesman for E. T. Fraim, proprietor of the Keystone Lock Works of that city, died on May 25 from typhoid fever, aged 31 years. He had traveled the jobbing trade between Denver and Philadelphia and was well known to the hardware trade.

Iron and Industrial Stocks.

The developments of the week were not conducive to an advance in prices. Liquidation continued among holders of prominent railroad stocks and their persistent sales influenced the entire stock market. Some of the iron stocks were sharply depressed by the difficulties of a Montreal house of brokers having a New York connection. The house suspended on Tuesday of this week, precipitating a panic in the Montreal market. The members of the firm had been speculating heavily in Dominion Iron & Steel and in Sloss-Sheffield stocks. Dominion fell to 12¾, recovering afterward to 14¾; Sloss-Sheffield common declined to 41⅛, afterward recovering to 43. During the week American Locomotive common declined to 21½, recovering to 22½; Colorado Fuel to 62½, recovering to 67¼; Republic common to 14⅞, recovering to 16; Tennessee Coal & Iron to 53½, recovering to 55¼; Steel common to 30⅞, recovering to 31⅞; Steel preferred to 80½, recovering to 81¾. The new Steel 5 per cent. bonds showed continued strength, transactions having been heavy, and the price was carried up to 87.

Dividends.—International Silver Company, Meriden, Conn., have declared a quarterly dividend of 1 per cent. on the preferred stock, payable July 1. Books close June 5 and reopen July 2.

The Natural Gas Company of West Virginia have declared an extra dividend of 2 per cent., payable June 5. This is the second extra 2 per cent. dividend this company have paid this year. The first was paid on April 30.

The Union Natural Gas Company of Pittsburgh have increased their capitalization from $8,000,000 to $9,000,000. The company will begin to pay dividends at the rate of 8 per cent. annually in October.

National Enameling & Stamping Company have declared the usual quarterly dividend of 1¾ per cent. on the preferred and 1 per cent. on the common stock, both payable July 1.

Mention has been made of the disposal of certain land in the Indian Territory, and there are 445,000 acres set aside for sale to the public, which may be coal and asphalt land. When all the land set aside for town sites has been sold it is believed the Indians of the two tribes will have $20,000,000 to their credit from that source alone. In this centennial year of the Louisiana purchase it is worth while noting that the sum is greater than the amount paid for the whole territory, of which the Indian territory is only a very small part. The assertion that the Indians living in the territory are the richest people on the earth is based upon the fact that the poorest of them has a citizenship worth at least $10,000. Any Chickasaw or Choctaw who can get the consent of the authorities there may go into the open market and sell for the sum mentioned what he is entitled to receive when he comes into full possession of all his property. The Osages have property which makes the poorest among them worth $15,000. The activity in segregation is due to the fact that there is an agreement between the United States and the five nations whereby the last of the tribal governments is to be abolished on or before March 4, 1906. With the disappearance of tribal governments goes the community of land interests. Instead of holding land in common the Indians must hold their lands in severalty.

The Powell Coal & Coke Company is the name of a new company just chartered, with a capital of $300,000, for the purpose of developing a tract of 6000 acres of coking coal on the Tygarts Valley River, in West Virginia, between Grafton and Fairmont, on the main line of the Baltimore & Ohio Railroad Company. The seam of coal is self draining and can be easily and cheaply mined and coked. A plant of 200 ovens will be built at once. The contract for the brick and other materials has been let. The company will do the work. The parties interested in the Powell Company own a tract of 5000 acres of coal adjoining and are the chief stockholders in the Valley Falls Coal & Coke Company, who own 1200 acres of coal adjoining the last named tract. This company are an operating company, and their plant of 30 ovens is turning out coke.

Salem G. Le Valley, a large dealer in sporting goods, Buffalo, N. Y., died suddenly on May 30 from a stroke of paralysis. Mr. Le Valley was born in Cambria, Niagara County, N. Y., on July 26, 1842, and had been identified with the business as clerk and proprietor since 1870.

The National Electric Light Association.

The twenty-sixth convention of the National Electric Light Association was held on Tuesday, Wednesday and Thursday, May 26 to 28, at the Auditorium Hotel, Chicago. The attendance was large, about 850 delegates and visitors being present. Much enthusiasm was exhibited throughout the meeting.

The opening session of the convention was called to order by the president, L. A. Ferguson, on Tuesday morning. The president read a resolution adopted by the city council, welcoming the association to Chicago, which upon motion was acknowledged by the association and transmitted to the city authorities. The president's annual address showed an increase in the membership of 225 per cent. during the past year. Mr. Ferguson, in his report, touched upon the work which had been accomplished by the association during the year and the various matters of interest which had come up for consideration. T. C. Martin of New York presented a report on progress in electric lighting, beginning with statistics of the industry and noting the increasing use of incandescent lighting.

A valuable paper on "Office Methods and Accounting," prepared by W. H. Anthony, comptroller of the Chicago Edison Company, formed an interesting topic for discussion by the members.

The Tuesday afternoon session was devoted to the reading and discussing of papers, among them being "Advantages to be Derived from Consolidation of Electrical Interests," by Sidney Hosmer of Boston; "Standard Transformer Voltages," by John S. Peck of Pittsburgh; "Boiler and Furnace Efficiencies," by A. Bement of Chicago; "The Application of Four Ampere Series Arc Lamps for Street Lighting," by J. Henry Halberg of New York, and "Notes on Enclosed Arc Lamps," by Professor Elihu Thompson.

President Ferguson opened the Wednesday morning session by announcing the Committee on Nominations, following which a paper upon "The Young Engineer in the Electric Lighting Plant" was presented by Charles F. Scott of Pittsburgh. "Tactful Relations with Customers," by John W. Ferguson of the Chicago Edison Company, and "The Attitude of the Employer Toward Benevolent Insurance and Educational Associations Among Employees," by Arthur Williams of New York, were well received.

At the Wednesday afternoon session the subject of "Steam Turbines" was presented by Prof. William Lispenard Robb of Renssalaer Institute, Troy, N. Y., which was listened to with close attention and called forth a great deal of discussion from the delegates. At the close of the discussion the delegates visited the new Fisk street plant of the Commonwealth Electric Company, where 14 5000 kw. steam turbines are to be installed.

The Thursday morning session was given up to the reading of papers and discussions. John W. Glidden of De Kalb, Ill., gave his report upon "District Steam Heating." A paper on "Salt as a By-Product" was read by Alex. Dow of Detroit. Professor Clifford of the Massachusetts Institute of Technology spoke on "Some Fundamentals in Photometry," and Professor Matthews of Purdue University read the report of the committee on "Investigation of Photometric Values of Arc Lamps." Mr. Williams of New York, with the use of illustrations, presented his paper on "Decorative and Sign Lighting."

"Relative Advantages of Electrical and Mechanical Methods of Variable Speed Control for General Power Service" was the title of a paper read by Wm. Cooper of Cincinnati at the opening of the Thursday afternoon session. Other papers were as follows: "The Theft of Current," by Robert L. Elliott of Chicago; "Unaccounted For Current," by H. T. Hartman.

It was decided upon the recommendation of the Committee on the President's Address to appoint a committee to report at the next annual meeting upon the development of the steam turbine, one thousand dollars being set aside for this purpose.

The officers and Executive Committee elected for the ensuing year are as follows:

President, Chas. L. Edgar, Boston.

First Vice-President, T. B. Livermore, Winona, Minn.

Second Vice-President, John W. Lieb, Jr., New York.

Executive Committee, Louis A. Ferguson of Chicago, H. H. Bottomley of Fall River, Mass., and Alex. Dow of Detroit. The secretary and treasurer are to be appointed by the new president. The next annual meeting of the association will be held at Boston.

On Monday evening a reception was tendered the delegates by the local electrical interests, which was well attended and greatly appreciated.

The St Louis Settlement.

(By Telegraph.)

ST. LOUIS, Mo., June 2, 1903.—The St. Louis Metal Trades Association came to a decision with the machinists, blacksmiths and allied metal mechanics who were out on strike, whereby they agreed to an increase of 7½ per cent. in wages and a revision of the agreement. A week's work for day and night shifts now consists of 54 hours and all work outside schedule is to be paid for as overtime. Up to this hour the brass workers and pattern makers have not arrived at a settlement, and are still out. Important meetings are being held to-day, and it is possible that a settlement will be brought about.

The National Steel & Wire Company.

The National Steel & Wire Company have issued an attractive little book, the leading feature of which is a reprint of an article from the New Haven *Register*, of April 5, 1903, describing the local operations of this company. Their most important plant is located at New Haven, Conn., being operated under the name of the National Wire Corporation. Illustrations are given of the company's new rod mill, boiler house, field fence factory, wire mill No. 1 and wire mill No. 2, the last named being in process of construction. Interior views are given of wire mill No. 1 and of the machine shop. The processes followed at New Haven are described and the character of the plant is fully set forth. At present this plant is being operated on billets imported from Sidney, Nova Scotia, where they are manufactured by the Dominion Iron & Steel Company.

The New Haven works manufacture the materials which are used by the works of the company operated under the name of the Union Fence Company, at DeKalb, Ill.; the DeKalb Fence Company, also at DeKalb, Ill., and the Pacific Steel & Wire Company, at Oakland, Cal. Illustrations of these plants are also given in the publication. Views are presented of the various styles of fencing manufactured in the factories of the company, and a great deal of information is given relative to the wire rope which they manufacture. Interesting logging scenes are presented showing how wire rope is used in the transportation of logs.

The company are manufacturers of wire for electric purposes, and the method of manufacturing electric wire is described. The list of products of the National Steel & Wire Company is so comprehensive that four pages, each a double column page, are necessary for this purpose. The officers and managers of the National Steel & Wire Company are among the most experienced men in the wire business, many of them having been connected for years with the Washburn & Moen Mfg. Company and the American Steel & Wire Company. The new company are one of the few independent corporations manufacturing wire rods, wire, wire rope, field fencing, telegraph and telephone wires and other wire specialties.

The striking pattern makers of Pittsburgh have removed their tools from the different shops in which they were employed, as they were notified to do by the Manufacturers' Association some days ago if they did not return to work on June 1 at the same rate of wages they formerly received. The men refused to accept this proposition, and the outlook is that the trouble will not be settled for some time.

Eastern Yards Machinery Bids.

The following bids for supplies for the Eastern yards were opened at the Bureau of Supplies and Accounts, Navy Department, Washington, May 26:

Bidder 1. Alphonso Custodis Chimney Construction Company, New York.
2. Western Electric Company, New York.
3. Prentiss Tool & Supply Company, New York.
4. Maine Electric Company, Portland, Maine.
5. Pawling & Harnischfeger, Milwaukee, Wis.
6. North Penn Iron Company, North Penn Junction, Pa.
7. Detrick & Harvey Machine Company, Baltimore, Md.
8. Walter H. Foster, New York.
9. Drew Machinery Agency, Manchester, N. H.
10. Edward J. Etting, Philadelphia, Pa.
11. Niles Tool Works Company, Hamilton, Ohio.
12. General Incandescent Arc Light Company, New York.
13. Morgan Engineering Company, Alliance, Ohio.
14. Manning, Maxwell & Moore, New York.
15. George Place, New York.
16. General Electric Company, Schenectady, N. Y.
17. Thresher Electric Company, Dayton, Ohio.
18. Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.
19. Allis-Chalmers Company, Chicago, Ill.
20. Crocker-Wheeler Company, Ampere, N. J.
21. Williamson Bros. Company, Philadelphia, Pa.
22. Holtzer-Cabot Electric Company, Brookline, Mass.
23. Rockwell Engineering Company, New York.
24. Bentel & Margadent Company, Hamilton, Ohio.
25. L. A. Woods Machine Company, South Boston, Mass.
26. Northern Engineering Works, Detroit, Mich.
27. Office Bank & Library Company, Boston, Mass.

Class 1. One 15 and one 6 horse-power direct current electric motors.—Bidder 1, $526.50; 2, $552.15; 22, $581; 18, $630; 9, $705; 20, $790; 17, $790; 16, $881.

Class 2. One 25 horse-power electric motor.—Bidder 22, $651; 4, $675; 18, $711; 16, $745; 17, $747; 20, $778; 9, $830.

Class 3. One 75, one 20 and one 6 horse-power electric motors.—Bidder 17, $2752.50; 16, $2834; 20, $4743; 22, informal; bid on part of class.

Class 4. Three 5 and three 2¼ horse-power motors.—Bidder 4, $834; 20, $1083; 17, $1110; 22, $1134; 16, $1176; 9, $1239; 12, $1257; 18, $1284.

Class 5. Thirty horse-power iron clad direct current motor.—Bidder 18, $510; 4, $660; 22, $735; 17, $750; 20, $830; 16, $1016.

Class 6. Six crucible brass furnaces.—Bidder 10, $2250; 23, $2886; 9, $3519.96.

Class 7. Three-motor electric traveling crane.—Bidder 26, $2094; 11, $2600; 9, $2695; 10, $2700; 5, $2800; 14, $2932; 6, $2960; 13, $3230.

Class 8. Plate scarfing machine.—Bidder 8, $4150; 14, $4200; 7, $4250.

Class 9. Horizontal steam steering engine.—Bidder 2, $7100.

Class 10. Sabining plant.—Bidder 23, $7100.

Class 11. Molding machine.—Bidder 25, $562; 24, $572; 14, $610; 15, $925.

Class 12. Upright molding machine.—Bidder 14, $180; 25, $327.50; 15, $404.

Class 13. Improved vertical mortiser and borer.—Bidder 25, $185.60; 3, $220; 24, $220; 15, $233; 14, $300.

Class 14. Automatic knife grinder.—Bidder 14, $225; 11, $288; 25, $325; 9, $338.

Class 15. Single bolt threader.—Bidder 3, $429; 9, $439.50 and $517; 14, $440; 11, $468; 7, $474.

Class 16. Swing cut-off saw.—Bidder 25, $71.75; 3, $75; 9, $75; 24, $75; 15, $79; 14, $100.

Class 17. Improved combined rip and crosscut saw.—Bidder 25, $225; 14, $280; 15, $318.

Class 18. Upright drill.—Bidder 11, $82; 14, $100; 9, $109 and $115; 3, $124.

Class 19. Improved jointing and facing machine or buzz planer.—Bidder 14, $185; 9, $197; 3, $200; 15, $200; 24, $200.

Class 20. Planing machine.—Bidder 25, $635; 9, $678; 16, $862; 3, $970.

Class 21. Pattern makers' lathe.—Bidder 14, $60; 3, $92; 24, $120; 15, $144.

Class 22. Improved tenoner.—Bidder 25, $183; 24, $188; 14, $265; 15, $277; 3, $240.

Class 23. Band saw machine.—Bidder 25, $171; 24, $174; 14, $175; 3, $180; 15, $235.

Class 24. Hand saw filing and setting machine.—Bidder 25, $63; 9, $65; 7, $90.

Class 25. Sawmill outfit.—Bidder 19, $8530.

Class 26. Circular brick chimney.—Bidder 1, $6880.

Class 27. Index and check system outfit for construction and repair.—Bidder 27, $671.

Henry G. Morse, president of the New York Shipbuilding Company, Camden, N. J., was stricken with apoplexy on June 2 in the office of J. P. Morgan, New York, and died an hour later in the Astor House. Mr. Morse was born in Poland, Ohio, April 10, 1850. He was graduated from the Rensselaer Polytechnic Institute, in Troy, in 1871, and entered the service of the Pennsylvania Railroad as engineer. In 1873 he became engineer for the Wrought Iron Bridge Company, Canton, Ohio, and continued in that employment until 1878, after which, for nine years, he was part owner of the Morse Bridge Company, Youngstown, Ohio. During the next nine years he was president of the Edgemoor Bridge Works, near Wilmington, Del. He then went into ship building. From 1896 to 1898 he was president of the Harlan & Hollingsworth Company, at Wilmington, and after that took up the organization of the New York Shipbuilding Company. He was a member of the American Society of Mechanical Engineers and the American Society of Civil Engineers.

Practically all of the machinists employed in the marine shops in New York City and vicinity are now out on strike. As previously stated in *The Iron Age*, the men presented demands to take effect June 1, which included the establishment of a minimum wage rate of $3 per day for all receiving less than that amount and an increase of 5 per cent. for all who were receiving $3 a day or more. Various efforts were made by the employers to adjust matters, but the union stood firmly to their demands. As the employers involved are members of the New York Metal Trades Association, it was decided to refuse the terms asked in all of the shops. This announcement was made known on Monday last, and the following day the machinists engaged in all of the Brooklyn marine shops went out. It is stated at this writing that the men employed in the Borough of New York went out Wednesday morning. Only marine shops are affected.

By floods, fire and tornadoes vast areas in the West and South have been inundated or devastated, and property worth millions lies in ruins. Besides the large loss of life and the destruction of the homes of thousands of the living, great manufacturing plants have been rendered idle. How much equipment has been ruined cannot now be estimated. With such cities as Topeka and Atchison, Kan.; Kansas City, St. Louis, and Hannibal, Mo.; Des Moines, Iowa; Lincoln, Neb., and a great number of smaller cities and towns under water or ravaged by fire, however, the loss will be very large, as in these cities are located hundreds of manufacturing plants. Tornadoes have also been very destructive in Iowa and other Western States, while in Gainesville, Ga., the loss of life has been appalling.

The Lubricating Metal Company, 141 Broadway, New York, who were organized the latter part of last year, are having a good demand for their anti-friction metal, Noheet, and report prospects as very encouraging. Their metal is made under a process of hardening lead without the use of antimony, zinc or copper, and while it retains its original toughness, it is four times as hard. Tests show a remarkably low percentage of friction, and power to stand up under the heaviest class of machinery. Job E. Hedges is president; F. W. Moffett, vice-president and general manager, and Hector W. Thomas, treasurer.

The Continental Iron Works, Brooklyn, are now running full force, the strike having been settled last Wednesday by the men returning to work. They received no concessions, and the demand for the recognition of the union was abandoned. The other boiler works in this vicinity are also gradually recovering from strike conditions, their workmen daily returning in increasing numbers.

The conference to arrange the wage scales for sheet mills was held in Pittsburgh on Wednesday, June 3, committees being present from the American Sheet Steel Company and the Amalgamated Association. The changes embraced in the scale as prepared by the Amalgamated Association are very slight, and for this reason it is expected the sheet scale will be fixed up this week.

MANUFACTURING.

Iron and Steel.

An inspection of the plants of the American Steel & Wire Company at South Sharon, Pa., was made a few days since. The party comprised several of the leading officials of the company, and it is announced that they regarded the South Sharon plants as being as near perfection as any in the world.

The American Rolling Mill Corporation contemplate extending their Fort Wayne (Ind.) plant, increasing the capacity to about 40,000 tons of bars, bolts, nuts, chains, &c. Plans for additions to the buildings and for the new equipment are being prepared. Upon the adoption of contemplated plans it is proposed to move considerable of the equipment now at the Muskegon (Mich.) plant to Fort Wayne.

The N. & G. Taylor Company are making extensive additions to their mills at Cumberland, Md., which include new open hearth furnaces with the necessary producer equipment, handling and charging apparatus, &c. General improvements are being made throughout the works which will add materially to the capacity of the plant.

Preliminary plans have been drawn by Walter Kennedy of Pittsburgh for the building of two blast furnaces, open hearth steel works and sheet and tin plate mills near Beaver Falls, Pa. A number of prominent capitalists and bankers of Beaver Falls and New Castle, Pa., are interested in the new enterprise, among these being John Reeves, president of the First National Bank of Beaver Falls, and M. Marquis, a large manufacturer of New Castle. If plans go through it is probable the initial plant will consist of only one blast furnace, this to be followed by the building of a second stack, and then an open hearth steel works, sheet and tin plate mills may be erected. The project is very much in its infancy and nothing definite has been decided upon as yet.

The Eleanor Iron & Steel Company, with works at Irwin, Pa., manufacturers of iron bars and skelp, may add an open hearth steel plant to their works.

No. 1 furnace of the Isabella group of the Carnegie Steel Company, at Etna, near Pittsburgh, has been blown out. The stack will be rebuilt and greatly enlarged. Furnaces Nos. 2 and 3 at this plant have been rebuilt and their capacity greatly increased since being acquired by the Carnegie Steel Company.

The capital stock of the Eastern Steel Company, Pottsville, Pa., has been increased from $1,000,000 to $1,900,000.

General Machinery.

The F. S. Johnston Company, Hartford, Conn., have incorporated with $5000 capital paid in. They will manufacture models and do a general machinery business. The incorporators are Frederick G. Johnston, F. C. Johnston and Thomas Standish. Frederick G. Johnston, formerly superintendent at Bement-Miles & Co., Philadelphia, has recently been engaged in the same business as the new corporation at Hartford, Conn.

The Ideal Machine Company of Hartford, Conn., have been reorganized with the election of these officers: President, Charles J. Jarvis; secretary and treasurer, W. H. Edwards, and superintendent, A. S. Pollard. Mr. Jarvis and Mr. Edwards are new stockholders. The company are capitalized for $10,000.

The Pennsylvania Engineering Works of New Castle, Pa., have the large addition to their plant nearly completed, and are rushed with work in all departments.

The Woodward & Powell Planer Company of Worcester, Mass., have bought additional land adjoining their machine shops, but there is no present intention of building. The company deny the report that they are to erect a new foundry.

The property of the Woodward Mfg. Company of Ashland, Mass., manufacturers of shoe machinery, has been advertised at auction by a trustee, the date of the auction being June 13.

The Waterbury Machine Company are about completing a new office building and an erecting room. The offices will be on the third floor of that building. The first floor will be given over to pattern storage and the drafting room will be on the top floor. The second floor has been taken by the Waterbury Wire Die Company. The erecting room is 30 x 110 feet, with monitor roof, and is equipped with a 10-ton traveling crane, furnished by the Northern Engineering Works of Detroit.

The foundry and machine shop formerly operated by M. Darragh & Co., at West Bridgewater, Pa., which was recently purchased by John W. Grove of Grove & Knox, Pittsburgh, will be operated by a new company to be known as the Grove Foundry & Machine Company. The output of the foundry, which is expected to be ready for operation June 20, will be small machine castings. The machine shop is to be overhauled and new machinery installed, but the requirements in this line are not yet known. The office will be with Grove & Knox in the Farmers' Bank Building, Pittsburgh.

T. Abbot & Son, proprietors of the Terrell Iron Works, Terrell, Texas, will rebuild their plant, which was recently destroyed by fire, and install entire new equipment. The new buildings will include a foundry, 65 x 85 feet; machine shop, 40 x 60 feet, and pattern shop, 30 x 60 feet.

The Milwaukee Commutator Company, Milwaukee, Wis., will rebuild their plant, which was recently destroyed by fire. Some machinery, including a 30 horse-power plant, will be required. Most of the equipment, however, is special and of their own design.

There is no truth in the current reports of the destruction by fire of the plant of the Perkins Machine Company of South Boston, Mass. Though the foundry was damaged, shipment of orders will not be delayed, as the company have two other foundries from which they can make prompt deliveries. The patterns were not destroyed.

Announcement is made of the organization of the Consolidated Press & Tool Company, 96-100 North Clinton street, Chicago, for the manufacture of presses, dies, sheet metal tools and special machinery, particular attention being given to the designing and developing of special and automatic machinery and attachments for sheet metal work. The officers are Charles S. Burton, president; H. C. H. Walsh, vice-president and factory manager; T. J. Potter, secretary and business manager, and George F. Lee, treasurer.

The Macgowan & Finnigan Foundry & Machine Company, St. Louis, Mo., recently incorporated with a capital stock of $50,000, have erected a plant in East St. Louis for the manufacture of harrows, the Newton roller and pulverizer and House cold tire setter. All machinery has been secured.

The Keystone Mfg. Company, Buffalo, N. Y., have moved into their new plant on Chandler street. The building is of stone, brick and steel, 80 x 150 feet, and is equipped throughout with modern appliances for the manufacture of their line of machine tools, radial drills and wrenches. Power is supplied from the Niagara Falls power plant.

The Triner Scale & Mfg. Company have been incorporated at Chicago with a capital stock of $20,000, to manufacture tools, dies and machinery.

The Gruson Iron Works of Eddystone, Pa., have changed their name to the Eddystone Foundry & Machine Company. The Philadelphia office is located in the Penn Square Building.

The Toledo Machine & Tool Company of Toledo, Ohio, have outgrown their present quarters and have just let the contract for a new shop, 100 x 262 feet. A portion of this building will be five stories, the balance two stories. The managers of the company have visited many of the best modern shops in the country for the purpose of getting full information concerning modern machine shop methods, and they believe when their new shop is finished it will be one of the most perfect and best equipped shops in the United States. The new shop will have a 30-ton, 40-foot span, electric traveling crane, with a 150-foot runway. During the past four years the company have been gradually disposing of their old machine shop equipment, replacing it with the best machine tools on the market, and orders have already been placed for a large amount of new equipment to be installed in the new shop. Industrial railways, pneumatic hoists and overhead trolleys are some of the features to which especial attention has been given. The contractors are under bond to have the new building completed by July 25. A large portion of the new equipment is now on cars at Toledo, and the company expect to be doing business in their new quarters by August 15, when their present capacity will be more than trebled. It is possible that the capital stock will shortly be increased to $250,000, to enable the company to handle their increased business.

The Falls Rivet & Machine Company have succeeded to the business of the Falls Rivet & Machinery Company, Cuyahoga Falls, Ohio. Edwin Seedhouse is president and Samuel Higgs treasurer.

The Ideal Electric & Mfg. Company, recently organized at Mansfield, Ohio, to build a line of electrical machinery, have selected these officers: Charles H. Voegele, president; William Dow, vice-president; S. G. Vincent, secretary and manager, and Samuel E. Huenerfauth, superintendent. Messrs. Vincent and Huenerfauth were formerly identified with the Phoenix Electric Company. The company will establish a plant at Mansfield and are looking for a site.

L. S. Denison of Ravenna, Ohio, has purchased the plant and business of the Denison Mfg. Company of Warren. He will rearrange the shop and will put in a job machine department, besides manufacturing a number of metal novelties of which he is the inventor. Mr. Denison has a factory at Ravenna, which will be removed to Warren. He formerly owned the Denison Mfg. Company at Warren, but sold out a number of years ago to establish the factory at Ravenna. Now the two are to be consolidated.

Power Plant Equipment.

The Eel River Electric Light & Power Company, Ukiah, Cal., will construct a flume and ditch from a point on Cold Creek to the old Cleveland mill, where they propose to erect an electric plant, to be operated by water power.

The Fitzhugh-Luther Company, Chicago, have been incorporated with a capital stock of $250,000, to manufacture engines, cars, &c., the incorporators being C. F. Fitzhugh, J. P. Luther and S. H. Strawn.

The Reeves Engine Company of Trenton, N. J., have increased their capital stock from $400,000 to $425,000.

M. J. Whittall of Worcester, Mass., is to build a new power plant for his large carpet mills. It will be a separate building, 60 x 100 feet, and one story high. It will contain a boiler room and an electric plant, the purpose being to establish electric units through the mills.

The recently organized Springfield Mechanical Boiler Cleaner Company, Springfield, Ohio, have secured a plant, which they will equip for the manufacture of the Roberts mechanical boiler cleaner and small power rotary engines. Most of the machinery has been arranged for. The Roberts cleaner consists of a series of blades so arranged as to mechanically operate within the boiler by means of the steam therefrom, while the boiler is in active operation. The device occupies but little space and it is claimed that by operating it twice a day the boiler can be kept free from scale or sediment, and absolutely clean. It is built especially to meet the requirements of each particular boiler, and is installed upon a low rental basis, the payment commencing when the cleaner has demonstrated its usefulness. The officers are: N. H. Fairbanks, president; A. J. Beckley, vice-president; E. C. Price, secretary, and W. H. Thompson, treasurer.

The Globe Power Company, with a capital stock of $200,000, have been incorporated at Buffalo, N. Y., for the manufacture of machinery. The company will also manufacture rotary engines of the Hoffman patent. The incorporators are W. M. Hoffman, E. E. Hoover and G. H. Hoover of Buffalo.

The Farquhar Engine Company of York, Pa., have secured an order from the United States Government, at Washington, D. C., for a 10-ton road roller. A 100 horse-power Corliss engine was last week shipped to Salisbury, Mo.

The Metcalfe Mfg. Company's new machine shop at Quincy, Pa., is almost completed, and the company, who have been much hampered by the delay in its construction, will at once begin to extend their operations. Thus far their business in gasoline engines has been confined to the East and South. They now propose to begin advertising extensively in the West, and will vigorously push the introduction of their engines there. A new style gas engine has been tested at the Geiser Company's shops and will be marketed.

L. Forrest McConhie, representing the Ingersoll-Sergeant Drill Company of New York, secured the contract for the construction of two wells and for furnishing compressors, motors, &c., for the water works system of Tacoma, Wash. Their bid was 14,875.

Foundries.

The Indiana Foundry & Machine Company, South Bend, Ind., recently incorporated with $10,000 capital stock, will erect a foundry for the manufacture of brass and iron castings and hardware specialties. They are in the market for new equipment. The officers are: J. Bergan, president; A. A. Forsyth, vice-president and general manager; W. W. Bergan, secretary, and F. L. Dennis, treasurer.

The lockout of the molders of the Penn Steel Casting Company of Chester, Pa., continues, and there is no prospect of a settlement in the near future. Of the 60 men discharged 30 are in Chester, idle. Nonunion men employed at the mills in their places are turning out a fair tonnage.

The Meadville Malleable Iron Company, Meadville, Pa., are enlarging their works and installing a new melting furnace with additional annealing ovens, which will enable them to double their present output. The enlarged works are expected to be in full operation early in September.

The large new foundry of the Sharon Foundry Company, at Wheatland, Pa., was put in operation on Monday, June 1. The concern will manufacture a general line of mill and blast furnace castings and ingot molds.

Bridges and Buildings.

The Toledo Portland Cement Company of Toledo have placed a contract with the Forest City Steel & Iron Company of Cleveland for the structural material that will be required for the large cement plant they are erecting at Manchester, Mich.

The Youngstown Wire & Iron Company, recently organized at Youngstown, Ohio, have elected the following officers: P. J. O'Neill, president; J. H. Wagner, vice-president; J. J. O'Neill, secretary and treasurer; G. D. Clifford, manager, and T. H. Hyde, engineer. This company have been awarded the contract for all the structural iron work, including the fire escapes, for the Buhl Hospital, in Sharon, Pa.

Fires.

The rod and wire mills of Kidd Brothers and Burgher Steel Wire Company, at McKee's Rocks, Pittsburgh, were completely destroyed by fire on Tuesday, June 2. The concern were manufacturers of polished drill rods, polished needle wire, black steel rods and other fine wire specialties.

The packing plant of C. Dietrich & Sons, Allegheny, Pa., was damaged $100,000 by fire, May 28.

The Malone Paper Company's mill, at Malone, N. Y., was destroyed by fire May 27, causing a loss of $100,000.

The plant of the Oldbury Chemical Company, Niagara Falls, N. Y., was destroyed by fire May 31, causing a loss of about $100,000.

The Christiana Window Glass Company's works, Wilmington, Del., were burned June 1. The loss will reach $50,000.

The bookcase and office specialty plant of the John Danner Company, Canton Ohio, was destroyed by fire May 31, entailing a loss of $100,000.

The Hall Iron Works, Lockport, N. Y., were damaged $20,000 by fire March 29.

On May 31 a fire which started in the boiler room of the Racine Boat Mfg. Company, swept the southern manufacturing district of Racine, Wis., doing about $300,000 damage. The losses in part are as follows: J. I. Case's threshing machine shops, $150,000; Standard Oil Company's works, $5000; Racine Boat Mfg. Company's plant, $115,000, and several smaller factories, $25,000 in all.

Eight buildings at Max Meadows, Va., belonging to the Virginia Iron, Coal & Coke Company, were destroyed by fire May 20.

Hardware.

The Hussey Mower & Implement Company of Knightstown, Ind., have moved into their new plant, comprising three one-story brick buildings, 50 x 200 feet, covering about 12 acres of ground. One of the buildings will be utilized as a foundry and one of them as a machine shop and assembling department. The officers of the company are: E. B. Hussey, president; R. W. Hussey, vice-president and general manager; F. S. Hussey, secretary.

The Crescent Forge & Shovel Company, Havana, Ill., have been organized, to manufacture the high grade agricultural steel shapes heretofore one of the departments of work of the Havana Metal Wheel Company. The latter company will continue the manufacture of metal wheels and low down metal wheel farm trucks.

The Grain Separator Company have been organized at Sparta, Wis., with a capital stock of $10,000, to manufacture a patented grain separator. The officers of the company are: President, E. H. Shattuck; vice-president, C. H. Shattuck; secretary and manager, W. C. Hawkins; treasurer, W. H. Stetting.

The Orion Hay Press Company, Orion, Ill., have been organized, the incorporators being G. A. Fair, P. Westerlund and F. L. Anderson. The company will manufacture hay presses.

The Excelsior Needle Company, Torrington, Conn., are to make two considerable additions to their plant this season. One new building will be 42 x 97 feet on the ground and three stories high; the other 22 x 97 feet and one story. The purposes of the new buildings are to concentrate the storehouses under one roof and for general manufacturing.

The North & Judd Mfg. Company, New Britain, Conn., are to erect two large buildings this summer. One building will be 50 x 134 feet and five stories high. The second floor will be occupied by offices, the space now given up to offices to be converted into a shipping room. Above the offices will be the packing room, and the remainder of the building will be devoted to a stockroom, which the company are in need of. The other building will be an annealing room, 70 x 163 feet. It will be of steel construction throughout, with expansive metal roof. The rear of the building will be open its entire length, with steel shutters, the purpose being easily to air out the room and to enable easy conveyance of materials. Above, the opening will be glass to the roof. The side walls will have the maximum of glass. The monitor of the roof will have sheet steel blinds, while the roof over each wing will be of glass. As a result the room will be exceedingly light and airy, the steel blinds permitting of ample ventilation above. The furnaces will be equipped for both oil and coal. The company have recently completed a new boiler room and a tin room.

The Traut & Hine Mfg. Company, New Britain, Conn., have extended their boiler house and installed a new 100 horse-power boiler, made by the Bigelow Boiler Company of New Haven, Conn.

Landers, Frary & Clark, New Britain, Conn., are enlarging their cutlery plant. They have built over an old building which was 60 x 110 feet by raising it one story and extending it until it is now 45 x 220 feet and four stories high.

The Russell & Erwin Mfg. Company, New Britain, Conn., are erecting a building, 50 x 200 feet, and seven stories high, it being an addition to their general hardware department. A Filer & Stowell engine has been installed to furnish power for the new building.

The Sun Mfg. Company, Greenfield, Ohio, are intending to remove to Columbus in the fall. They are now erecting a large plant in that city, which will enable them to more than double their present output. They expect to have the new building ready for occupancy about October 1. This increase in their facilities is necessary to permit them to keep up with the demand for their various lines. The orders for their Sun No. 10 cash register both at home and abroad are beyond their capacity to supply. The same is true of their line of coffee mills and combination showcases, while a constantly increasing demand is reported for their money drawers. The location in Columbus

will also furnish better transportation facilities than they enjoy at present.

Miscellaneous.

The new shops of the Huber-Hodgman Printing Press Company, at Taunton, Mass., are nearly completed and will be ready for occupation by July 1, providing that power is ready at that time. The company are to buy their power from the new Municipal Lighting Plant of the City of Taunton, and there is some question whether that power station will be ready for business by July 1, in which case the Huber-Hodgman Company will have to defer operations until power is ready for them. In the meantime they will occupy their present quarters in the plant of the Taunton Locomotive Mfg. Company. The Taunton Locomotive Mfg. Company have been building presses for the Huber-Hodgman company for some years and are completely equipped for that purpose. An arrangement has been made between the Locomotive company and the Campbell Printing Press Company by which the Taunton concern are to manufacture the Campbell press, and an order for 20 presses has been placed. This does not necessarily mean, however, that the Taunton company will be the exclusive manufacturers of this press, though they may be. At present the Campbell company have their work done at Plainfield, N. J. The Taunton Locomotive Company have taken a two years' contract for the castings for the Huber-Hodgman company.

The Pascagoula Street Railway & Power Company, Scranton, Miss., who are constructing a 10-mile trolley road from Pascagoula to Scranton, are building a 700 horse-power plant and will furnish light to four towns. They will also operate water works and a 30-ton ice plant. All equipment has been purchased. S. S. Bush is general manager and Samuel Young engineer.

The Pullman Steel Ventilator Company of York have received contracts for the equipment of St. Mary's School, Toledo, Ohio, and a public school in Pittsburgh.

About 25 employees of the Westinghouse Air Brake Company, at Wilmerding, Pa., went to New York City last week at the expense of the company to make a test of the latest air brakes for high speed trains. The tests were made on the New Jersey Central Railroad and were participated in by all the companies making air brakes, including the New York Air Brake Company. The tests were made at the instance of the railroads for the purpose of ascertaining what improvements for fast trains have recently been made that will be valuable to the railroads. The men from the Westinghouse works were in charge of Arthur Johnson, Sr., an engineer of the company and an expert in the manufacture and equipment of railroad brakes.

The United States Oil & Gas Well Supply Company of Pittsburgh last week forwarded the last shipment of pipe and material for the construction of a water plant for Nome, Alaska. The material required about four cars in all, and it will be sent to Seattle and there transferred to steamer for the Alaskan port. The water plant is for a large mining company there and the work of installing the equipment will be carried to completion by the Pittsburgh concern.

The York Safe & Lock Company of York, Pa., have just completed a 30-ton vestibule and vault door for the Cleveland Savings & Loan Association of Cleveland, Ohio. This is one of the largest contracts ever undertaken by the company.

The Century Stove & Mfg. Company of Johnstown, Pa., have re-elected these directors: R. S. Wilson and Robt. Munro of Pittsburgh; J. H. Waters, E. C. Warren and S. B. Waters of Johnstown; Rowland S. Wilson was re-elected president; Robert Munro, vice-president; John H. Waters, treasurer, and E. C. Warren, secretary and general manager. The directors authorized the sale of a block of treasury stock sufficient to supply 8000 feet additional floor space for the plant. During the past 14 months the company have turned out 23,000 stoves, 1300 ranges and 45,000 pieces of special work, doubling the amount estimated at their organization.

The Van Dorn Iron Works of Cleveland, Ohio, are bidding on the construction of 40 steel cells for the Warren County jail at Warren, Pa.

At the annual meeting of the Keeley Stove Company of Columbia, Pa., these directors and officers were elected: H. F. Bruner, William Patton, J. H. Herr, Hiram Wilson, William Morris, Frederick Bucher, Horace Detwiler, D. H. and William B. Given, directors; H. F. Bruner, president; J. E. Shomler, secretary and treasurer.

Plans have been made by W. O. Webber, mechanical engineer, of Boston, for a shop for F. Meisel & Co., who will manufacture printing presses. The shop will be located at Dorchester, Mass., and will be 60 x 320 feet and three stories high. Mr. Meisel was formerly with the Kidder Printing Press Company.

The Atlantic Works at East Boston, Mass., are to erect a new storehouse, 90 feet square, one story high, with monitor roof. It will occupy the site of a blacksmith shop, which will be torn down to make the necessary room. The storehouse will be equipped with a traveling crane and will have every other modern convenience.

The Consolidated Paper & Bag Company, Elkhart, Ind., will rebuild their plant, which was recently burned. Practically no new equipment will be required, as the machinery and boilers were not destroyed.

A large automobile factory is to be established at Morgantown, W. Va., of which Geo. J. Humbert, president of the Rolling Mill Company of America, now building a plant at Morgantown, is president.

The Moffett Electric Railway Bearing Company of New York, recently incorporated with a capital of $3,000,000, intend to erect a plant for the manufacture of bearings for street cars. No site has as yet been selected, but the plant will probably be located in the vicinity of Toledo, Ohio. The officers are S. B. Thorp, Jr., president; Geo. B. Sadler, secretary, and John Holran, treasurer. S. B. Thorp, Sr., 290 Broadway, New York, is at the head of the enterprise.

The McCullough-Dalzell Crucible Company, Pittsburgh, Pa., have had 31 years of experience in the manufacture of plumbago crucibles. They make crucibles of every size and for every purpose, but do a very large business in crucibles for steel and brass melting. In addition they make stoppers, sleeves, nozzles, crucible covers or caps, lids, skimmers, stirrers, dipping cups, domes, phosphorizers, cylinders, &c.

The Youngstown Wire & Iron Company have been organized at Youngstown, Ohio, and will build a works for the manufacture of light iron and wire work, bank and office railings, wire and iron window guards, sidewalk gratings and lights, fire escapes, stall fixtures, wire and iron fences. The officers of the company are G. D. Clifford, president; J. H. Wagner, secretary and treasurer, and T. H. Hyde, manager.

A partnership has been formed between Edward D. Thayer, George Crompton, Randolph Crompton and William B. Scofield for the manufacture of silk, worsted and woolen looms at Worcester, Mass., and the work of making patterns has already begun. The plans are not, however, fully formulated, beyond the fact that standard looms will be built. The location and size of the plant are not yet determined, beyond the fact that it will be in Worcester. It is probable that space will be hired for a beginning. The Messrs. Crompton are sons of George Crompton, founder of the Crompton Loom Works, which was afterward combined with the Knowles Loom Works as the Crompton & Knowles Loom Works. The Cromptons sold out their interests in the business to the Knowles interests in the fall of 1900, and have since been out of the business. Edward D. Thayer is probably the largest individual woolen manufacturer in the United States, owning the Merchant Mills at Dedham, Mass.; the Thayer Mills at Cherry Valley, Mass., and the controlling interest in the Worcester Woolen Company at Worcester. Mr. Scofield was until recently the head of the Worcester Thread Company, who sold out to the consolidation of thread interests.

The Broadbent & Davis Mantel Company, Baltimore, Md., will erect a seven-story building, 125 feet square, at a cost of $150,000. New power equipment will be installed. The company manufacture wood mantels exclusively.

The Magnolia Metal Company, New York, are having plans prepared for a new building to replace the one destroyed by fire a year ago.

The frame factory which is being constructed by the Michigan Sprocket Chain Company at Delray, Mich., will be pushed to completion as rapidly as possible. The building is I shaped, 40 x 80 x 104 feet, and will be utilized for the finishing of the company's product—chains for agricultural, mining, hoisting, elevator and other machinery—the material for which will be supplied from the adjoining plant of the Malleable Iron Company. The following are the stockholders of the chain company: T. H. and J. L. Simpson, G. M. Black and Lewis Nelson.

The Forest Packing Company, Boston, Mass., were incorporated in December, 1902, and the company have recently put upon the market the Forest and Evergreen brands of steam packing and a general line of asbestos and rubber specialties. The factory and office of the company are at 145 High street, where they have a factory floor space of 42 x 100 feet. The officers are: G. R. Noble, president; Walter Danforth, treasurer; Benjamin G. Ward, secretary. The company claim to be the only manufacturers of ring packing in New England.

The Hoyt Metal Company, St. Louis, Mo., will commence at once to rebuild the rolling mill recently destroyed by fire. The mill was the only building damaged to any great extent, the two other buildings which were slightly burned not being sufficiently damaged to interfere with their operation. The total loss to the plant will not exceed $30,000, and this is fully covered by insurance.

The Damascus Brake Beam Company, St. Louis, Mo., have purchased 2½ acres of ground at Youngstown, Ohio, where they will erect a plant, 70 x 240 feet. The contract for the building has been let, and the equipment, including a 50 horse-power engine, bulldozers, punches, grinders, riveting machines, &c., has been arranged for.

The Union Switch & Signal Company of Pittsburgh have been awarded the contract by the Interborough Rapid Transit Company of New York City to completely equip the new subway with signals in time for the operation of trains within a year.

The Peerless Motor Car Company of Cleveland, manufacturers of gasoline automobiles, report that there is no truth in the

rumor that they are planning to remove their plant to Canton, Ohio. They will remain in Cleveland and have purchased property adjoining their present plant where they propose to erect a large shop which will enable them to increase the output several fold. The company are now producing about eight large vehicles per week.

The Truss & Cable Fence Company of Cleveland have been reorganized, with Herbert Wright, president; T. E. Young, vice-president; O. J. Bechtel, treasurer, and W. W. Blair, secretary and general manager. The company are operating a plant for the manufacture of wire fence at Hornellsville, N. Y., but they are laying plans to erect a large and modern plant in Cleveland, when the Eastern plant will be abandoned. They have established general offices at 605-606 Cuyahoga Building, and are making a strong bid for the farm and railway trade.

The Westinghouse Air Brake Company of Wilmerding, Pa., have received a contract for 2000 sets of new electrical air brakes, which are now being generally adopted on traction lines. They were first tried on the Manhattan Elevated Railroad in New York City after the installation of the third rail system, and worked so successfully that other traction lines are adopting them. This order for 2000 sets was received from the Transit Company of St. Louis, Mo., and will equip the traction cars of that system for the exposition service.

An Important Drawback Ruling.

Entries Heretofore Suspended to be Liquidated.

WASHINGTON, D. C., June 2, 1903.—Assistant Secretary Armstrong, in charge of customs matters in the Treasury Department, has prepared a decision amending the standing drawback regulations in a manner that will be of decided benefit to manufacturers and exporters. The immediate result of the decision will be the allowance of a number of drawback entries which, as recently stated in these dispatches, were suspended several weeks ago on the ground that the exporters had failed to file with the Department formal applications for the fixing of a rate of allowance before presenting their drawback entries at the custom house. A diversity of practice has recently developed at the ports of New York, Boston and Philadelphia based upon the diverse construction of the following provision of the drawback regulations: "No drawback shall be allowed on any article of domestic manufacture exported until the rate of allowance has been established by the Secretary of the Treasury."

At Boston and Philadelphia it has been held that this provision forbids the filing of an export entry until the rate of allowance has been established by the Department, but at New York it has been construed to mean that no payment of drawback shall be made until the rate has been fixed by the Department, although entries may be made and the goods shipped after careful inspection before the rate of drawback has actually been determined. The Treasury Department was not fully advised concerning the practice in force at New York, and when it was recently learned that the goods covered by certain entries had been shipped before the application for the fixing of a rate had reached Washington, a number of pending entries were ordered to be suspended until the matter could be carefully investigated. Assistant Secretary Armstrong has shown a very commendable spirit of liberality in dealing with these cases and has reached the conclusion that inasmuch as the drawback entry describes the goods in detail, and is in fact the only statement of the exporter which is considered in connection with the expert examination of the merchandise before its shipment, the interests of the Government are fully safeguarded, and hence the formal application to the Department for the fixing of a rate as a condition precedent to shipment may be waived, although of course no drawbacks will be paid until the rate of allowance has been determined. As the result of this decision the suspended entries will be passed and in the course of a few days a circular will be prepared amending the regulations so as to remove the ambiguity by reason of which the difference in practice at the ports mentioned has grown up. Under the amended regulations the practice in force at New York will be continued, while that in vogue at Boston and Philadelphia will conform thereto.

Recent Drawback Regulations.

The Treasury Department has recently issued a number of drawback regulations of special interest to the readers of *The Iron Age*. Upon the application of the Yale & Towne Mfg. Company of New York City drawbacks have been allowed on the shipment of iron pulleys equipped with imported chains permanently attached to the pulley blocks. It is provided that the preliminary entry shall show the marks and numbers of the shipping packages, the gross and net weight of each package, together with the net weight of the pulley block and the net weight and size of each chain contained in each package, separately and in the entire shipment. The drawback entry must show the marks and numbers of the shipping packages, the net weight and size of each chain exported in pulley blocks, separately and in the aggregate, corresponding with the import invoices.

Upon the application of the Stamford Foundry Company of Stamford, Conn., drawback has been allowed on ranges manufactured in part of imported pig iron. It is prescribed that the preliminary entry shall show the marks and numbers of the shipping packages, the gross and net weight of each package separately and the quantity and percentage of imported pig iron consumed in the manufacture. The drawback entry must show the marks and numbers of the shipping packages and the gross and net weight of each range exported, together with the quantity and percentage of imported pig iron consumed in the manufacture of the same. In liquidation, the weight of imported pig iron which may be taken as a basis for allowance of drawback may equal the quantity consumed or declared in the drawback entry, but in no case shall it exceed the net weight of the exported merchandise, officially verified, with 5 per cent. of such weight added thereto to compensate for loss incurred in the manufacture.

Regulations have also been prepared for the allowance of drawback on the exportation of certain turbo-electric generators manufactured by the Westinghouse Electric & Mfg. Company, of Pittsburgh, Pa., wth the use of imported steel rotating parts. The regulations require that a sworn transcript of the manufacturing records shall be filed with the drawback entry, showing the weights of the forgings used as imported, together with the value and number of pounds of the finished article, the quantity of valuable waste, the value of such waste at the factory at the time of manufacture, and the price at the works of the imported material. The manufacturing records must at all reasonable times be open to the inspection of customs officers. In liquidation the quantity of imported steel which may be taken as the basis for allowance of drawback may equal the net weight of the exported articles declared in the drawback entry with an addition to compensate for loss based on the value of the valuable waste at the time of manufacture and the price paid at the works for the imported material. W. L. C.

Deputy Sheriff Cronin of New York has received an attachment for $20,000 against Frank A. Umsted of Worcester, Mass., in favor of William Howard, Jr., on a note made by John L. McLaurin of South Carolina, dated April 21, payable one month after date at the Mercantile National Bank of this city. It was indorsed by Mr. Umsted, and delivered to the Guardian Trust Company. The note was not paid at maturity, and after being protested was turned over to Mr. Howard. Mr. McLaurin in an affidavit with the complaint stated that he signed the note for a consideration, that Mr. Umsted indorsed it, and McLaurin obtained the $20,000 from the Guardian Trust Company for Mr. Umsted. The money was handed over to Mr. Umsted. The Sheriff attached a certificate for 16,809 shares of stock of the Brunswick & Birmingham Railroad Company of Georgia, which was supposed to belong to Mr. Umsted, but a third party claim has been put in for the stock by the Brunswick & Birmingham Construction Company, and the title to the stock will be tried before a Sheriff's jury next week.

The Armour Institute of Technology of Chicago announces a course in Fire Protection Engineering. A pamphlet has been issued giving details.

The Iron and Metal Trades.

The leading Southern makers, as an association, have at their meeing in Birmingham decided to sell at $15 for No. 2 at furnace for delivery during the balance of the year. This will probably be widely heralded as a cut of $1.50 and $2.50 respectively from the former nominal prices of $16.50 to Eastern and $17.50 to Western points. As a matter of fact the market has been at the $15 level for at least two weeks, and it looks as though the association were engaged in a stern chase of the market.

The real question is whether buyers will abandon the waiting attitude in which they have persisted for some time past, and begin to cover for the future, or whether they can and will persist in buying from hand to mouth; whether an "official" recognition of the true market by a group of leading sellers will be a sufficiently powerful incentive for action. It is pretty generally conceded that founders have bought very little thus far for the second half, on the threshhold of which we now are, but this does not necessarily lead to immediate contracting on a large scale.

The point is made that we approaching a level at which a number of poorly located and poorly supplied foundry furnaces will find it hard to make ends meet. It is well understood that every pot which can make Iron is running, although at costs which are very high. In fact the best of furnaces, controlling their own raw materials, are struggling with cost figures which they would have deemed impossible three years since. But even the worst of furnaces do not blow out until the last hope has been exhausted, while pressure on inflated costs usually yields considerable readjustments.

The next few weeks will establish the position of buyers, to be determined largely by the rate at which they expect to meet.

The Steel market has been growing somewhat easier, the only movement reported being in the Chicago district, where some round sales have been made. In the Central West and in the East the supply is growing somewhat more liberal. Foreign Steel can apparently be taken only for export goods.

Generally speaking the Finished Iron and Steel trade is quieter and, on the whole, the tonnage for new work is falling off somewhat in a number of branches, and that notably in the East. The Bar trade continues unsettled to some extent. The trades which chiefly serve the building industry are adversely affected by the labor troubles. Report has it that leading interests have been studying the question of prices for next year. This is known to be a fact in Steel Rails.

As showing how enormous has been the structural tonnage, the fact may be noted that the American Bridge Company booked over 101,000 tons during May.

In the Metal market Lead is displaying signs of a coming cut.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	June 3, 1903.	May 27, 1903.	May 6, 1903.	June 4, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$19.50*	$19.50	$21.00	$19.75
Foundry Pig No. 2, Southern, Cincinnati	*18.25*	18.25	19.25	19.25
Foundry Pig No. 2, Local, Chicago	*20.00*	20.00	21.50	21.50
Bessemer Pig, Pittsburgh	*19.85*	19.85	20.10	21.50
Gray Forge, Pittsburgh	*19.00*	19.75	20.00	19.75
Lake Superior Charcoal, Chicago	*24.00*	24.00	24.50	23.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	*29.00*	29.50	31.00	32.25
Steel Billets, Philadelphia	31.00	....	*$29.50	....
Steel Billets, Chicago	*31.50*	32.50	32.60	....
Wire Rods, Pittsburgh	37.00	37.00	37.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*17.00*	17.00	18.50	19.00
O. Steel Rails, Philadelphia	*21.00*	21.00	21.50	21.00
O. Iron Rails, Chicago	*22.50*	23.00	24.50	24.00
O. Iron Rails, Philadelphia	*24.00*	24.50	24.50	24.50
O. Car Wheels, Chicago	*22.00*	22.50	24.00	20.50
O. Car Wheels, Philadelphia	*22.50*	21.00	24.00	19.50
Heavy Steel Scrap, Pittsburgh	....	....	21.50	....
Heavy Steel Scrap, Chicago	*16.50*	16.50	18.50	19.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.85	1.85	1.93½	2.05
Common Iron Bars, Chicago	*1.75*	1.75	1.85	1.75
Common Iron Bars, Pittsburgh	*1.80*	1.80	1.89¾	1.80
Steel Bars, Tidewater	1.75	1.75	1.75	1.90
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater	1.80	1.80	1.80	2.00
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.73½	1.73½	1.73½	2.25
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.73½	1.73½	1.73½	2.25
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh	*1.90*	2.00	2.05	2.25
Skelp, Sheared Iron, Pittsburgh	*2.00*	2.10	2.10	2.35
Sheets, No. 27, Pittsburgh	2.65	2.65	2.65	2.95
Barb Wire, f.o.b. Pittsburgh	2.60	2.60	2.60	2.90
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	2.00	2.05
Cut Nails, f.o.b. Pittsburgh	2.15	2.15	2.15	2.05
METALS:				
Copper, New York	14.75	14.75	14.75	12.40
Spelter, St. Louis	**5.50**	5.50	5.40	4.50
Lead, New York	4.37½	4.37½	4.37½	4.10
Lead, St. Louis	*4.15*	4.15	4.22½	4.00
Tin, New York	*28.50*	28.45	29.90	29.65
Antimony, Hallett, New York	7.00	7.00	7.00	8.00
Nickel, New York	40.00	40.00	40.00	50.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.99	3.99	3.99	4.19

* Foreign.

Chicago.

FISHER BUILDING, June 3, 1903.—(*By Telegraph.*)

In some respects the outlook for Iron and Steel has improved, but this has been rather in the moral effect of a more general settlement of labor difficulties and a subsidence of the strike fever than in a material increase in the volume of business. The placing of contracts for Pig Iron for the last half of the year has been delayed incidental to a meeting of the associated furnaces of the South, who are expected to take definite action which may lead to a larger volume of business. To this end larger and more frequent inquiries have been made, agricultural implement manufacturers and Steel works being now in the market for a considerable tonnage. Sales during the week have been largely confined to lower grades, especially Forge Irons, which have been relatively in greater supply than Nos. 1 and 2 Foundry, which have been held above the parity of other grades. Bar Iron has continued slow and easy, with rumors of the shading of even 1.75c., base, Chicago. But this is probably a temporary flurry and incidental to the materially lower prices prevailing for Scrap and Forge Pig Iron. While new orders for Steel Bars have not increased, the market has improved somewhat, in that buyers have been given 90 days in which to make specifications on commitments made some time since, and the fact that the mills have orders on their books sufficient to keep them active for five or six months, if specifications are made promptly. There has been a good demand for Billets and some increase in volume of sales of domestic. Plates and Sheets have been quiet, but well sustained. The outlook for Structural Material seems somewhat improved, although not yet reflected in the volume of business. A few contracts have been placed during the week, and it is notable that jobbers especially have sent in more liberal orders to the mills. One feature of interest is the urgent call by

wire for bridge material from the flooded district in the Missouri Valley. It seems fortunate, too, that there is considerable second-hand material of this kind seeking a market, which has been offered by the trunk lines that are making great improvements, prominent among them being the Pennsylvania Railroad. An interesting feature of the week has been the increased demand for Rails, both Standard and Light Sections, which are to be shipped to the West and South. Old Material has steadied somewhat in sympathy with Pig Iron. Merchant Pipe and Boiler Tubes have continued to sell well, but Cast Pipe has been slow. Coke has been freely offered and the market is easy, but larger transactions are being invited by the lower prices.

Pig Iron.—While the purchases of large quantities of Low Phosphorus Iron by the United States Steel Corporation have brought inquiries from large buyers for Foundry grades, they have not resulted as yet in business of any importance. In fact, the general character of the market has changed but little, there being still a strong disposition to await developments on the part of consumers, and a general feeling that the meeting of the Southern Association furnaces at Birmingham on Tuesday, June 2, might bring about a change of policy which would lead to the long delayed buying movement. It is yet too early to know the result of the meeting. The tonnage sold in this market during the week has been probably equal to the average of recent weekly business, and mainly has been for deliveries during the next 60 days. It is notable that there has been a scarcity of No. 2 Foundry Iron, both North and South, business being confined largely to No. 3 Foundry, Soft and Silvery Irons and Mill grades, which have accumulated somewhat in the South. The transactions have given the impression that furnaces have been endeavoring to clear decks for action. The largest tonnage has been of Forge Iron, mills in this section buying more freely than for several months. However, the individual transactions have seldom gone over 300 tons, most of the sales being in lots of from 100 to 300 tons, within range of quotations. It is notable, however, that very little No. 2 Iron has been available at $15.50, Birmingham basis, for early shipment. There is some interest at the close in the fact that implement manufacturers are in the market for a large tonnage, and some sales of moment of Basic grades are pending. There is also a good inquiry for Bessemer Iron, both Malleable and Standard. Local prices, while irregular, are somewhat below the level indicated by recent purchases in the valleys. In fact, Malleable Bessemer is offered to a moderate extent at $19.50, Chicago, for delivery during the last half of the year, but for prompt shipments a little advance over these prices is asked. It is reported that the Southern Association will agree to $15, Birmingham, as the official price for No. 2 Foundry, for delivery during the last half of the year. The following are the prices current, f.o.b. cars, Chicago, for delivery during the third quarter, the outside price for prompt shipment:

Lake Superior Charcoal	$24.00 to $25.00
Local Coke Foundry, No. 1	21.00 to 22.00
Local Coke Foundry, No. 2	20.00 to 21.00
Local Coke Foundry, No. 3	19.00 to 20.00
Local Scotch, No. 1	21.50 to 22.50
Ohio Strong Softeners, No. 1	22.50 to 23.50
Ohio Strong Softeners, No. 2	21.80 to 22.30
Southern Silvery, according to Silicon	21.85 to 23.85
Southern Coke, No. 1	20.35 to 20.85
Southern Coke, No. 2	19.85 to 20.35
Southern Coke, No. 3	19.35 to 19.85
Southern Coke, No. 1 Soft	20.10 to 20.60
Southern Coke, No. 2 Soft	19.60 to 20.10
Foundry Forge	18.85 to 19.35
Southern Gray Forge	18.35 to 18.85
Southern Mottled	18.10 to 18.60
Southern Charcoal Softeners, according to Silicon	24.85 to 26.85
Alabama and Georgia Car Wheel	28.85 to 29.85
Malleable Bessemer	20.00 to 20.50
Standard Bessemer	20.50 to 21.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	27.30 to 28.30

Bars.—The situation has not changed essentially as far as Steel Bars are concerned, but a decided change is expected to develop within the next 30 days. Although the tonnage on the books of both Eastern and Western mills is considerably smaller than a year ago, orders are sufficient to keep the mills busy for six months if specifications were made promptly on commitments. Most contracts on the order books expire on July 1, and consumers have been given 90 days within which to specify on these contracts. It should be noted that while there is at present not the incentive for consumers of Bars to place large orders that there was last year when an advance was assured, at the same time nothing is to be gained by waiting, as prices have been and will be maintained at the present level, notwithstanding the popular belief in lower prices. A little business is coming forward and some specifications on old contracts. In Bar Iron, with the exception of a contract for 1000 tons designed for car building, the demand has been confined to small quantities and sales have been made mainly on the basis of 1.75c., Chicago, and even small lots have been difficult to sell above 1.80c., Chicago; but there are rumors that the 1.75c. base price has been shaded for the 1000-ton lot, which, in view of the lower prices prevailing for Forge Pig and Scrap Iron, is credited but not substantiated. The following the prices current, f.o.b. cars, Chicago, mill shipment: Bar Iron, 1.75c. to 1.80c.; Soft Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.16½c. to 2.26½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. There has been but little change in the merchant trade, the demand being readily met at the following prices: Bar Iron, 2.15c.; Soft Steel Bars, 2c. to 2.25c.; Angles, 2.25c., and Hoops, 2.40c., base, from store.

Structural Material.—There has been some little increase in the demand, but the improvement has been slight. The outlook, however, is more encouraging than for several weeks. Among the sales have been about 500 tons for the Navy Yard at Charleston and 300 or 400 tons for the Victoria Building, Chicago. Local jobbers have also placed larger orders with the mills. An interesting feature which may have some influence on the sale of new material is the offering of large quantities of railroad bridge material by trunk lines, notably the Pennsylvania road, which is replacing light structures by heavier material, made necessary by the ponderous locomotives and cars with which the lines are now being equipped. The strike outlook is much improved, however, and it is expected that both railroad and building work, which was suspended some weeks since, will be resumed in the near future. The market is steady and prices have been maintained as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. The sales by local jobbers have increased materially and the market has continued steady as follows: Beams and Channels, 2¼c. to 2½c.; Angles, 2.25c. to 2.50c.; Tees, 2.30c. to 2.55c., at local yards.

Plates.—Small orders aggregating about 2000 tons have been placed during the week and fair specifications have been received on commitments. The production of local mills is sold for several months and the market has continued firm at the following prices, f.o.b. cars, Chicago, mill shipment: Tank Steel, ¼-inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c. There has been a moderate demand for shipment from local stocks and prices have been well sustained as follows: Steel, ¼-inch and heavier, 2.15c. to 2.20c.; Tank Steel, 3-16-inch, 2.25c. to 2.30c.; No. 8, 2.30c. to 2.40c.; Flange Steel, 2.40c. to 2.50c., all f.o.b. warehouse, Chicago.

Sheets.—A better inquiry has been received for Black Sheets, both for prompt shipment and later deliveries, which develops the fact that the mills are not suffering for orders and prices are well sustained by both independent and combination mills. The outlook is more favorable than for several weeks. The following are the prices current for Black Sheets, carload lots, Chicago, mill shipment: No. 10, 2.12½c. to 2.16½c.; No. 12, 2.22½c. to 2.26½c.; No. 14, 2.32½c. to 2.36½c.; No. 16, 2.42½c. to 2.46½c.; Nos. 18 and 20, 2.56½c. to 2.60½c.; Nos. 22 and 24, 2.66½c. to 2.70½c.; No. 26, 2.76½c. to 2.80½c.; No. 27, 2.86½c. to 2.90½c.; No. 28, 2.96½c. to 3.00½c. Small lots from store sell at from 10c. to 20c. above mill prices. Galvanized Sheets have met a better inquiry and the market has remained steady on the basis of 75 and 10 discount, Pittsburgh, and 75 and 5, Chicago, for mill shipment. Sales from local stocks are made on the basis of 75 and 2½ to 75 discount.

Cast Pipe.—The demand has been very light, even current orders being for small quantities and not of large tonnage in the aggregate. Only one municipal contract has been made during the week, amounting to about 1200 tons of 6's to 24's, which was taken by the Detroit works at about on the basis of $30.50, delivered at Grand Rapids, Mich. For small orders manufacturers continue to sell at the following prices, f.o.b. cars, Chicago: Four-inch, $33 to $34; 6-inch, $32 to $33; 8-inch, $31.50 to $32, and larger, $31 to $31.50, for Water, and $1 per ton higher for Gas Pipe.

Billets.—There has been a more active inquiry than a week ago and some buyers of round lots are in the market, resulting in sales of about 10,000 tons of Rerolling Bessemer Billets, and another similar amount is pending. There has also been a fair inquiry for Open Hearth Forging Billets, which have sold at $33 to $39, according to analysis, buyer and time of delivery. Rerolling Billets are quoted at $31.50 to $32.50, Chicago. Nothing of interest in regard to foreign Steel has developed during the week.

Merchant Pipe.—Sales during the month of May show a material increase compared with sales during 1902, and the demand continues unusually active. It is notable, too, that there is a good sale for line Pipe and Casing from the gas belt, where Merchant Pipe is little used. A firm tone has prevailed and prices have remained unchanged, based on the following schedule of discounts, for carload lots, Chicago base, random lengths, mill shipment:

	Steel Pipe.		Guaranteed Wrought Iron.	
	Black.	Galvd.	Black.	Galvd.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ to ⅜ inch	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches	67.35	57.35	64.35	54.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—Orders from the jobbing trade have continued satisfactory and the market has remained firm without change in prices. The following schedule of discounts is current:

	Steel.	Iron.
1 to 1½ inches	43.35	38.35
1¾ to 2½ inches	55.85	35.85
2¾ to 5 inches	60.85	45.85
6 inches and larger	55.85	35.85

Less than carloads, 12½ per cent. advance.

Local distributers have continued to book satisfactory orders from day to day and prices have been well maintained. The following are the discounts for shipments from local warehouse:

	Steel.	Iron.
1 to 1½ inches	40	35
1¾ to 2½ inches	50	32½
2¾ to 5 inches	57½	42½
6 inches and larger	50	"

Merchant Steel.—The market for nearly all kinds of Shapes has been quiet, but otherwise without new features of interest. There is still some inquiry for implement manufacturers, but other interests are not well represented in the market. There has been but a moderate inquiry for Tool Steel and small sales of Shafting, but an increased business is confidently anticipated about the first of next month, when renewal contracts will be made. The market has remained steady as far as prices are concerned, which are unchanged, as follows, at Chicago for mill shipment: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

Rails and Track Supplies.—There has been increased demand for both Standard and Light Sections, with sales of about 12,500 tons of Standard for shipment to Utah, which will be used on the new line to Southern California. Sales of Light Rails have amounted to about 2500 tons, one lot of 1100 tons going into the South. The Standard Rails were for delivery during the last half of the year, and the Light Sections for prompt shipment. A strong tone has continued to prevail, and official prices are unchanged, at $28 for Standard and $27 for Second Quality, mill shipment. Light Rails have continued to sell at $35 to $40, according to weight. Track Supplies have remained firm, with a good demand for all kinds. The following are the prices current at Chicago for mill shipment: Splice or Angle Bars, 2c. to 2.25c.; Spikes, 2.10c. to 2.25c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 3c.; with Hexagon Nuts, 3c. to 3.25c. From store, 10c. to 15c. over mill prices are asked and obtained.

Old Material.—A few grades of Scrap have continued weak and further declines have followed, but as a rule the market is steadier at the low prices, with less pressure to sell, although the demand has not increased materially. The tendency, however, is toward a firmer market, and a reaction even is possible. The following are the prices current per gross ton, Chicago:

Old Iron Rails	$22.50 to $23.00
Old Steel Rails, mixed lengths	17.00 to 17.50
Old Steel Rails, long lengths	22.00 to 22.50
Heavy Relaying Rails	31.00 to 31.50
Old Car Wheels	22.00 to 22.50
Heavy Melting Steel Scrap	16.50 to 17.00
Mixed Steel	14.50 to 15.00

The following quotations are per net ton:

Iron Fish Plates	$18.50 to $19.00
Iron Car Axles	23.00 to 23.50
Steel Car Axles	22.00 to 23.00
No. 1 Railroad Wrought	18.00 to 18.50
No. 2 Railroad Wrought	16.00 to 16.50
Shafting	18.00 to 19.00
No. 1 Dealers' Forge	15.00 to 15.50
No. 1 Busheling and Wrought Pipe	13.50 to 14.00
Iron Axle Turnings	13.00 to 13.50
Soft Steel Axle Turnings	13.00 to 13.50
Machine Shop Turnings	12.75 to 13.00
Cast Borings	8.00 to 8.50
Mixed Borings, &c	10.00 to 10.50
No. 1 Boilers, cut	13.50 to 14.00
Heavy Cast Scrap	15.50 to 16.00
Stove Plate and Light Cast Scrap	12.00 to 12.25
Railroad Malleable	15.00 to 16.00
Agricultural Malleable	14.00 to 14.50

Metals.—Only a moderate demand has been experienced during the week, but at the close there is some little improvement in inquiry, with larger sales anticipated in the near future. Prices, however, remain steady, at 14½c. for Casting and 15c. for Lake in carload lots, Chicago. Pig Lead has been in fair demand and the outlook is improving, but prices in this market have remained nominal on the basis of 4.30c. in 50 to 100 ton lots and 4.32½c. in carload lots, Chicago. Spelter has continued strong and active, with sales made mainly at 5.50c. in carload lots for Slabs. Sheet Zinc is very scarce and prices are little better than nominal at 8c., Chicago, in a jobbing way. Old Metals have been in fair demand, with a little easier tone prevailing for Copper and Brass, but Lead and Zinc have continued strong. Heavy Cut Copper sells at 12c., Red Brass at 11¾c., Copper Bottoms at 10⅞c., Lead Pipe at 4c. and Lead at 4.25c., spot.

Coke.—The local market is easy under large offerings and only a moderate demand for spot supplies, but more active inquiry for contracts covering the last half of the year. Furnace Coke sells at from $2.50 to $3.50, and Standard Foundry Coke at $3.50 to $4, at the ovens. Sales of Standard Foundry grades have been made at $5.65 to $6.65, spot track, Chicago. The entire output—several thousand tons—of one company is reported sold for the last half of the year on the basis of quotations.

Philadelphia.

FORREST BUILDING, June 2, 1903.

The close of the fifth month of the year finds the Iron and Steel trades in a somewhat confused condition. Generally speaking, as much material is being used as at any time on record, but there is a pretty well defined impression that important changes are pending. It may be simply a readjustment of prices, or it may be that the large additions to productive capacity are at least equal, if not in excess of consumptive requirements; but whatever the cause, there is indubitable evidence that there is no scarcity of material, and that prices are considerably lower than they were six or eight months ago, and are still very much unsettled. It may not be safe to assume that prices will reach a lower level than those of to-day, but if they do, it will by no means be an unmixed evil. There would be a good margin of profit at $18 for Pig Iron when proper adjustments are made, besides having the further advantage of keeping out foreign material, the tonnage of which has been over 1,000,000 tons during the past year. The situation is too uncertain, however, to warrant positive forecasts. All that can be said as matters of fact are that at the moment there is a notable absence of new business, an unusual irregularity in prices, and not a few evidences of larger supplies than we have had for three or four years past. There is plenty of room for speculation in regard to the whys and wherefores, but the unexpected has happened so frequently that the safe plan will probably be to follow the example of buyers by limiting everything to short dates, pending further developments.

Pig Iron.—The last week in May was the dullest that has been known at any corresponding period for several years past. Large buyers are not in the market, so that prices do not interest them to the extent of inducing bids for forward deliveries. Small lots are taken at market price, whatever that may be, and that depends on the character of the Iron and other conditions that appertain to the transaction. As a rule $20 to $20.50, delivered, has been the range for No. 2 X Foundry, but the lots were mostly carloads or from that to 100 or 200 tons each, so that they are of no special significance as regards the ultimate course of the market, except as an indication that buyers' ideas are the reverse of what they were a year ago, when they were clamoring for six months' deliveries at higher prices than are now ruling. At the same time it is obvious that a great deal of Iron is going into consumption, and buyers cannot keep out of the market very much longer. The situation is just about what might be expected, however, as a general readjustment is necessary in accordance with new conditions. Whether this will result in a lower range of prices or not remains to be seen, but if it does, and rock bottom is reached, it will be the best thing that could happen. Stability in prices will be likely to result in increased activity, and, as we said before, lower prices with stability will be more satisfactory than irregularity with uncertainty. It is a fact that there is considerable divergence of opinion in regard to the ultimate outcome of prices. Some are willing to discount the future quite sharply, others are content to let the market take its own course, meanwhile taking business at such prices as may seem reasonable when the bids are made. The difficulty is with the buyers, however, who are not disposed to make bids, and in some cases refuse offers of material at what appear to be extremely low figures, such, for instance, as good Mill Irons at $18, delivered. Quotations, therefore, must be subject to revision from day to day, but in ordinary cases they would be about as follows for city or nearby (June or July) deliveries, and possibly a shade less for later dates:

No. 1 X Foundry	$21.00 to $21.50
No. 2 X Foundry	19.50 to 20.50
No. 2 Plain	19.00 to 19.25
Gray Forge	18.00 to 18.50
Basic	19.00 to 19.25
Middlesbrough, No. 3	19.00 to 19.50

Cargo lots c. i. f.:

Low Phosphorus, 0.035	$20.85 to $21.00
Middlesbrough, No. 3	16.75 to 17.25

Steel.—The demand is confined to lots for early delivery, for which sellers quote $31 to $31.50, delivered; but buyers are extremely discriminating in what they take. There is an impression that prices will rule at lower figures during

the last half of the year, consequently purchases are merely to tide over the next few weeks.

Plates.—In one way or another there is a good deal of business doing, but it is not of a character that indicates a very strong position. Prices are not as firm as could be desired, and a good deal of twisting around is indulged in to secure what is regarded as desirable business. It is hoped that the comparative inactivity of the past week will soon be succeeded by more favorable conditions, but in the meanwhile there is no doubt that the situation is not very satisfactory. Prices are about as follows for city and nearby deliveries: Small lots, 1.95c. to 2c.; carload lots, ¼-inch and thicker, 1.75c. to 1.80c.; Universals, 1.80c.; Flange, 1.90c.; Marine, 2c. to 2.05c.; Fire Box, 2.10c. to 2.20c.

Structural Material.—The strike in the building trades exercises a depressing influence, so that new business is somewhat restricted. There is a great deal of work on hand, however, and if specifications come in as usual the mills will have plenty of work during the summer months. Prompt deliveries can be had, however, at unchanged prices—say Beams, Angles or Channels, ordinary sizes, 1.73½c. to 1.80c. for carload lots, with the usual addition for smaller quantities.

Bars.—The Bar Iron trade is not in a very satisfactory condition at the present time, neither are prospects as good as could be desired. Work comes in rather slowly, and some of the mills are running close to the end of their orders; consequently prices are very irregular. Quotations are supposed to be 1.85c., delivered, for Refined Iron, and 1.70c. for Steel Bars, but on large orders it is said that buyers have done better than the figures named.

Sheets.—No change in Sheets. Fair demand for all the various numbers.

Old Material.—The market has been extremely dull during the past few days, with hardly enough business to establish quotations. Steel is fairly firm, however, but mill and foundry Scrap is dull and bids hard to get even at the inside figures. Holders expect a better demand in the near future, and in the meanwhile show no disposition to force the market. Quotations are as follows for deliveries in buyers' yards:

Old Steel Rails	$21.00 to $21.50
Heavy Steel Scrap	20.50 to 21.00
Low Phosphorus Scrap	28.00 to 29.00
Old Steel Axles	26.00 to 27.00
Old Iron Rails	24.00 to 24.50
Old Iron Axles	28.00 to 29.00
Old Car Wheels	22.50 to 23.50
Choice Scrap, R. R. No. 1 Wrought	22.00 to 23.00
Country Scrap	19.00 to 19.50
Machinery Scrap	18.50 to 19.50
No. 2 Light Scrap	18.00 to 19.00
No. 2 Light (Ordinary)	14.00 to 15.00
Wrought Turnings	15.50 to 16.00
Wrought Turnings, Choice Heavy	17.00 to 17.50
Cast Borings	10.75 to 11.25
Stove Plate	15.00 to 15.50

Thomas W. Simpers, formerly district sales agent for the American Sheet Steel Company and American Steel Hoop Company, has located at 802 Crozer Building, Philadelphia, as broker in Iron and Steel and will handle the usual line of Steel products, and solicits patronage in the specialties named.

Cincinnati.

FIFTH AND MAIN STS., June 3, 1903.—(*By Telegraph.*)

The announcement made and pretty generally published a week ago that the Southern Associated furnaces were to hold a meeting for the discussion of quotations June 1 produced, as might be expected, a decided indisposition on the part of buyers to experiment with the market at all. What few sales are reported as having been made during the week just past are at all sorts of prices, showing that the Iron as a rule was of some special grade desired by melters and the price bore but little relation to the general market quotations. Buyers have claimed that salesmen are offering No. 2 Southern Foundry on the basis of $14.50, Birmingham, but no actual sales are quoted less than $15. The Southern Association held their meeting to-day at Birmingham, and telegraphic advices received to-night by agents in this city announce the fact that the association has decided to offer Iron on the basis of $15, Birmingham, for No 2 Foundry. No details are available at this hour as to the general action of the meeting beyond the quotation just stated. There are some furnaces putting themselves on record as declaring they will not sell on the basis of $15, but it is hardly likely that any Iron will be sold on a higher basis for an indefinite time to come. The outlook for the coming week as to new business is uncertain. There is to be no difference made in the price in spot and forward delivery Pig Iron, and it is believed that the available supply is more than sufficient to cover all spot demands. Freight rates from the Hanging Rock district, $1.15, and from Birmingham to Ohio River points, $3.25. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

Southern Coke, No. 1	.... to $18.75
Southern Coke, No. 2	.... to 18.25
Southern Coke, No. 3	.... to 17.75
Southern Coke, No. 4	.... to 17.00
Southern Coke, No. 1 Soft	.... to 18.75
Southern Coke, No. 2 Soft	.... to 18.25
Southern Coke, Gray Forge	.... to 16.50
Southern Coke, Mottled	.... to 16.50
Ohio Silvery, No. 1	$25.15 to 26.15
Lake Superior Coke, No. 1	20.65 to 21.15
Lake Superior Coke, No. 2	19.65 to 20.15
Lake Superior Coke, No. 3	18.65 to 19.15

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$28.25 to $29.25
Lake Superior Car Wheel and Malleable	27.50 to 28.50

Plates and Bars.—The market is unchanged and rather quiet. We quote, f.o.b. Cincinnati, as follows: Iron Bars in carload lots, 1.92c., with half extras; same, in small lots, 2.20c., with full extras; Steel Bars, carload lots, 1.73c., with half extras; same, in small lots, 2.20c., with full extras; Plates, ¼-inch, in carload lots, are still nominally 1.70c.; 3-16 inch, 1.80c.; Beams and Channels, 1.70c., base.

Old Material.—Business has been rather dull and not promising much more activity in the near future. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $17 per net ton; Iron Rails, $20.50 per gross ton; Long Steel Rails, $19 per gross ton; same, short, $17 per gross ton; Iron Axles, $23 per net ton; Car Wheels, $24 per gross ton; Low Phosphorus Steel, $24 per gross ton; Heavy Melting Steel, $19 per gross ton.

Cleveland.

CLEVELAND, OHIO, June 2, 1903.

Iron Ore.—During the past week the United States Steel Corporation came into the market and beat the rate down from 85c. to 80c. from Duluth to Ohio ports on wild cargoes of Ore. This was followed by three or four days of persistent hammering of the rates, with the result that the Escanaba wild rate was established on a commensurately lower basis—namely, 60c.—from that port to Ohio. The wild shipments through Marquette have not been heavy enough to bring about any break in that rate. The constant excess of vessel capacity on the lakes and the crowded condition of the docks, when contract vessels alone were used, inclined the shippers to compel the independent vessel owners to accept a lower rate if their vessels were employed. This brought about a movment on the part of the vessel owners of the lakes toward a combination of the independent fleets, that some of the small boats which cannot make a profit or even expenses at this rate might be laid up to the docks until such a time as the conditions of the market shall establish better rates for all of the vessels engaged in the trade. The contract rates have not been disturbed, principally through a lack of business, and the wild rates have been established as follows: 80c. from Duluth, 75c. from Marquette and 60c. from Escanaba. The buying of Bessemer Pig Iron by the United States Steel Corporation brought about further talk of new buying of Iron Ore, but it has gone no further than the inquiry stage which now prevails. The market has been firm, without any change of prices, the list being based on the following quotations: $4.50 for Bessemer old range and $4 for Bessemer Mesaba. The delays to the vessels at lake ports have been very serious, and in some cases boats have been held up a week at the unloading ports. The car shortage has been blamed for this state of affairs.

Pig Iron.—The market recovers slowly regardless of the stimulus given to the trade by the buying of Bessemer Pig a week ago. There has been considerable activity in Bessemer and Basic, but the Foundry Iron market has continued dull, with nothing more substantial than inquiries. In the Bessemer trade the activity has confined itself to the outside furnaces, the association having done nothing. There are now reported sales by these independent concerns at higher prices than were obtained by the association from the Steel Corporation, the new quotation ranging between $19 and $19.35, valley furnace, for second half delivery. The buying of Bessemer for spot delivery is dead, nothing whatever having been reported. For that reason no quotation is made. In the Basic trade there have been reports of considerable tonnage having been placed. It is said that the purchases have been so heavy that the furnaces in this territory are sold up for the second half if all of the contracts placed are specified upon during the latter part of the year. The reports are that the material has been sold at $18.50 to $18.75, valley furnace, for second half. No quotation is made for June delivery, for the supply has been exhausted for some time and the shipments on old contracts continue as heavy as the production will permit. A diligent inquiry as to prices of Foundry fails to bring about anything that looks like a quotation upon which business is to be done. Spot buying is limited to the surplus of outside furnaces, which is diminished. Shipment from the furnaces has been heavy and the production has been as great as ever. The supply of Coke has met all requirements.

Finished Iron and Steel.—Regardless of the fact that specifications on former contracts are still light and that the mills are able to make deliveries in very short time, the Steel market is healthy and shows a very promising side. The market may be said to be strong all through. The Plate trade is the leading factor in interest and shows a revival of contract booking, with heavy inquiries for the future. The specifications on old contracts have been light and in some instances the mills are able, because of this situation, to make deliveries in two weeks to three months, according to the specifications. The business of the little mills has been lessened by this improved condition of the larger mills, but they have not abandoned their premium prices entirely, perhaps because the price of Steel will not permit it. They are now quoting 1.95c., Cleveland, and are having increasing difficulty to get their full quota of business. The association price holds at 1.60c., Pittsburgh. The structural trade are similarly situated. The demand for material has been very light until now, as a permanency of the decline for this year was feared because of the prevalence of labor difficulties. These obstacles have not been removed, but the situation is so much easier that new buying is possible. The jobbers are getting a little business out of stock, but the smaller mills have been forced by the prompt shipments made by the larger mills to abandon their premium policy. Quotations hold at 1.60c., Pittsburgh, from the mills and 2.15c. to 2.25c. out of stock. The Bar trade has not improved very much. The inquiries from the smaller buyers are still coming in, but the larger consumers have not bought their supply as yet. The situation in Bar Iron is weak, with some slight shading of the price. The larger mills are not coveting this business and do not take the decline seriously. Prices are as follows: 1.60c., Pittsburgh, for Bessemer Steel; 1.70c., Pittsburgh, for Open Hearth Steel, and 1.75c., Cleveland, to 1.80c., Youngstown, for Bar Iron. The Sheet trade is still strong and vigorous. The buying has been very heavy during the past few weeks and the market is in splendid condition. The mills are so well sold up that the question of deliveries is becoming insistent. The market has an upward tendency, but without any change as yet. The prices, therefore, are based on a quotation of 3.10c. to 3.25c. for No. 27 Black Sheets out of stock and 2.85c. to 2.95c. for the same gauge at the mills. There are a few calls for Rails, but most of the projects are still in the rumor stage and no effort has been made to place any big orders. The prices have held firm at $28 for standard and $36 for Light Rails, Pittsburgh, base. There has been a strong call for Billets, with a shortage of the material.

Old Material.—The market has been dull and listless, with only a moderate supply of material and very little demand. Prices are quoted, purely nominally, at: No. 1 Wrought, $19.50, net; Cast Borings, $12, gross; Car Wheels, $22.50, gross; Heavy Steel, $21, gross; Iron Rails, $25.50, gross; Iron Axles, $27.50, net; Wrought Turnings, $14.50, net; Old Steel Rails, $21, gross.

Pittsburgh.

PARK BUILDING, June 3, 1903.—(*By Telegraph.*)

Pig Iron.—The total purchases of Bessemer Pig Iron by the United States Steel Corporation aggregate 105,000 tons, of which 85,000 tons are for delivery in third quarter and 20,000 tons for shipment commencing June. For the third quarter Iron $18.50 at furnace was paid and for the prompt Iron $19 at furnace was the price. The Southern Furnace Association at their meeting yesterday reduced the price of No. 2 to $15, Birmingham; No. 3, $14.50; No. 4, $14, and Gray Forge, $13.75. This makes the price of Southern No. 2 $19.85 and Gray Forge $18.60 at Pittsburgh. It is hoped these lower prices will induce the large Foundry trade to come in the market and place contracts, and it is said that already several interests have bought good sized blocks of Foundry Iron at the new prices. Outside Steel interests have bought about 25,000 tons of Standard Bessemer Iron at $19 to $19.25 at Valley furnace, shipments to commence this month. The market on Gray Forge is extremely dull and local brands are offered as low as $19, Pittsburgh, but without finding buyers. Some small lots of Northern No. 2 Foundry have been sold at $20.50 to $21, Pittsburgh, but buying is very light.

Steel.—There is a fair amount of inquiry and prices are slightly lower. We quote Bessemer Billets at $29 to $29.50 and Open Hearth $29.50 to $30, maker's mill. We note a sale of 3000 tons of Bessemer Billets at $29, maker's mill. The lower prices on Bessemer Iron, due to the large sales to the United States Steel Corporation at $19.35, Pittsburgh, will reduce prices of Steel to some extent to concerns who buy on sliding scale contracts.

Skelp.—The Skelp market is exceedingly quiet, and while it is being pretty freely offered consumers are not buying. We quote Grooved Iron and Steel Skelp at 1.90c. and Sheared at 2c., Pittsburgh. On a firm offer this might be shaded.

(*By Mail.*)

The heavy purchases of Bessemer Pig Iron by the United States Steel Corporation, which up to date amount to about 105,000 tons, 90,000 tons for third quarter delivery and 15,000 tons for shipment commencing June, have created a much better feeling in the whole Iron market. It is probable that the Steel Corporation would have purchased a larger block of Iron if furnaces had been able to make deliveries wanted. The Southern Furnace Association is in session at this writing in Birmingham, Ala., and the outcome of the meeting is awaited with very great interest. Practically no foreign Iron is coming into the Pittsburgh market, the lower prices on Forge and Foundry having completely shut out the foreign article. Several concerns are still receiving deliveries on Iron bought some time ago, among these being a local Steel concern who bought a round tonnage three or four months ago. The Steel market is fairly active, with prices showing a slightly easier tendency, due to the lower prices for Bessemer Iron. It is of interest to note that the heavy sales of Bessemer Iron at $18.50, Valley, or $19.35, Pittsburgh, will fix a lower basis for Billets for concerns who buy on sliding scale contracts. Ir Finished Iron and Steel tonnage continues fairly large, especially in Plates, Structural Steel and Pipe, but on other lines, such as Sheets and Bars, demand is disappointing. There are no important changes in prices, the tone of the market being exceedingly firm.

Ferromanganese.—It is probable that a number of large users of Ferro will come in the market before long and place contracts for their requirements for last six months. We quote 80 per cent. Ferro at $50 in large lots and $52.50 in carload lots, f.o.b. Pittsburgh.

Plates.—Tonnage in Plates is not as large as it was some time ago, but is better now than two or three weeks ago, when demand fell off very perceptibly. The Steel car works all have heavy tonnage on their books, the Pressed Steel Car Company alone using 45,000 to 50,000 tons of Plates per month. Numerous other heavy contracts are being placed for Plates, and the mills are all comfortably filled for the next two or three months. Slight premiums are still occasionally paid for small lots for prompt shipment. Official prices are as follows: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Hoops and Bands.—There is a fair tonnage in Hoops and Bands and prices are well maintained. We quote Cotton Ties, 88c. in 5000-bundle lots and over, and 91c. for less quantities. Steel Hoops are 1.90c. on 250-ton lots and over, and 2c. in less quantities. Bessemer Bands are 1.60c. up to No. 12 gauge, and Open Hearth, 1.70c., extras as per Steel card. These prices are f.o.b. maker's mill.

Rods.—Demand for Rods is fairly active and prices, owing to limited supply, are very firm. We continue to quote Bessemer Rods at $37 to $37.50 and Open Hearth, ordinary carbons, $38 to $38.50, Pittsburgh. Chain Rods from Open Hearth Steel are held at about $40, maker's mill.

Muck Bar.—The market continues exceedingly quiet and we make nominal quotations of $34.50 to $35, f.o.b. Pittsburgh.

Spelter.—The market continues very firm and Spelter for prompt delivery is somewhat difficult to obtain. We quote prime Western grades at 5.58½c. for spot and 5.53½c. for futures, f.o.b. Pittsburgh.

Structural Material.—No large lots have recently been placed in this market, aside from the McKeesport and Lorain Tube mills, which have gone to the American Bridge Company and will require about 30,000 tons. The labor troubles in the building trades both East and West have caused a number of large jobs to go over until next year. We quote as follows: Beams and Channels up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.70c.

Sheets.—Prices on Sheets continue very firm, but tonnage is not as large as it was some time ago. The most of the leading mills are pretty comfortably filled, while others are not as busy as they would like. It is probable that a number of Sheet mills will close down the latter part of this month for repairs. The Sheet scale is to be taken up this week and will probably be very quickly adjusted, as the changes in the new scale are very slight. There is no change to note in prices and we quote Black Sheets as follows: Nos. 22 and 24, Box Annealed, one pass through cold rolls, 2.45c.; No. 26, 2.55c.; No. 27, 2.65c to 2.75c., and No. 28, 2.75c. to 2.85c. We quote Galvanized Sheets at 75 and 10 off in carload and larger lots for desirable orders,

but note that some mills are quoting at 75 and 7½ off. In small lots Galvanized Sheets are held at 75 and 5 off.

Merchant Steel.—Some small contracts continue to be placed by agricultural implement makers, but the larger contracts from these concerns will not come in until July. Demand for Tool Steel and also for Shafting is light. Prices show no material change and are as follows: Tire Steel, 1.80c. to 1.90c.; Open Hearth Steel, ordinary grades, 1.70c. to 1.80c.; Open Hearth Spring, 2.25c. to 2.35c.; Cant Hook Steel, 2.75c. to 3c.; Plow Slabs, Bessemer, 2.50c.; Plow Slabs, Open Hearth, 2.75c. to 2.85c.; Tool Steel, ordinary grades, 6½c. and upward; Cold Rolled Shafting, 42 per cent. off in less than carloads, and 47 per cent. in carloads, delivered in base territory.

Tin Plate.—The market on Tin Plate continues exceeding active, and the leading interest is understood to be sold up to August or longer. Prices are very firm, and outside Tin Plate mills advise us they are able to get from 10c. to 25c. a box advance over the official price, depending on the order and deliveries wanted by the buyer. We quote Coke Ternes at $3.90 to $4 a box, f.o.b. mill, the official price of the American Tin Plate Company being $3.80, Pittsburgh.

Iron and Steel Skelp.—We note sales of 4000 to 5000 tons of Sheared Steel Skelp for delivery in third quarter. The market on Skelp is exceedingly firm, most of the mills being sold up for the next 60 days or longer. Grooved Iron and Steel Skelp is held at 2c. and Sheared at 2.10c., f.o.b. Pittsburgh.

Pipes and Tubes.—Demand for Pipe is phenomenally large, and the leading mills have all the tonnage they can take care of for the next two or three months, and we are advised that several concerns are somewhat behind in deliveries. The Pipe trade so far this year is very much ahead of last year in tonnage. Prices to consumers in carload lots are as follows:

Merchant Pipe.

	Steel.		Wrought Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
⅝ to 6 inches	75	65	72	62
7 to 12 inches	69	59	66	56
Plugged and Reamed:				
1 to 4 inches	73	63	70	60
Cut 3 to 6 feet:				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
⅝ to 6 inches	71	60	68	57
7 to 12 inches	65	53	61	50
Cut 6 feet and longer:				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
⅝ to 6 inches	72	61	69	58
7 to 12 inches	66	54	62	51
Extra Strong Plain End:				
⅛ to 8 inches	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End:				
½ to 8 inches	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ per cent. advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 per cent. net for 6 feet and longer, and 15 per cent. net for 3 to 6 feet.

We may note, however, that some of the outside mills quote slightly lower prices on Iron Pipe than are given above.

Coke.—Output of Coke continues very large and seems to be considerably in excess of demand. For this reason premiums on prices for early delivery have almost entirely disappeared. There is a good deal of conjecture as to what will be the price of standard Connellsville Furnace Coke for last six months, and the consensus of opinion is that it will be about $3 a ton at oven. It is probable that main line Cokes will be offered at slightly lower prices. Foundry Coke for shipment over last six months will probably be about $4 a ton, and we are advised some contracts have already been made at this figure. Output of Coke last week in the upper and lower Connellsville regions was 304,300 tons, the heaviest output in any one week for some time.

Birmingham.

BIRMINGHAM, ALA., June 3, 1903.—(*By Telegraph.*)

At a meeting of Southern Iron interests held here today, No. 3 Foundry was made the grade for fixing the price basis, and $14.50 was adopted as the price for that grade. On Foundry grades above and below that there will be a difference of 50c. per ton for each grade. In the case of Forge Iron the difference is decreased to 25c. between grades. This makes Gray Forge $13.75, and the idea prevalent is that uniform prices will now prevail and dissension that has heretofore existed will cease. The Iron interests were strongly represented, and they believed this action will give a healthy tone to the Iron market.

New York.

NEW YORK, June 3, 1903.

Pig Iron.—Purchases during the past week have been light and there is no animation. So far as can be learned few melters are covered beyond this month, while the consumers of Basic Pig in the East have not as a rule bought beyond August. It remains to be seen whether the action of the leading Southern makers in announcing their readiness to sell on the basis of $15 for No. 2 at Birmingham will bring about any buying movement. In reality they have merely met the open market. We quote, for delivery at New York and tidewater, nominally, Northern No. 1, $20 to $21; No. 2 Foundry, $19 to $19.50; No. 2 Plain, $18.75 to $19. Tennessee and Alabama brands are: No. 1, $19.75 to $20; No. 2, $19.25 to $19.50, and No. 3 Foundry, $18.75 to $19.

Steel Rails.—The makers have not yet met, but it is expected that the meeting for determining prices for next year will take place at an early date. We continue to quote $28 for Standard sections, at Eastern mill.

Cast Iron Pipe.—The demand for small quantities shows no signs of letting up. Numerous orders of this character have been entered during the week. The outlook for heavier business and in larger sizes is much brighter. In the course of the next two or three weeks the city of New York will place contracts for Brooklyn, covering about 16,000 gross tons of 48 and 36-inch. Another contract will shortly be placed in this city, but not for municipal work, which will require about 2000 tons of 48-inch. During the next week or two the city of Schenectady will ask for bids on 23,000 feet of 36-inch Pipe, but it has not yet been decided whether this Pipe will be of Cast Iron or Riveted Steel. Carload lots are quoted at $36.50, gross ton, at tidewater, for 6 and 8 inch, and $35.50 for 12-inch and upward.

Finished Iron and Steel.—The American Bridge Company secured a sufficient tonnage in new orders during the week to bring their sales for the month of May to well over 101,000 tons, which, as foreshadowed last week, makes that month the largest in their history. The largest of these recent orders were the contracts for the John Wanamaker buildings in New York City and Philadelphia. The New York building takes 16,000 tons and the Philadelphia building 12,000 tons. This business has for some little time been the subject of newspaper comment, but the contracts were not actually signed until the past week. The business secured by the company during the month consisted largely of structural work and covers orders taken in all parts of the country. Plates are in fair demand, with local consumers buying more freely, as the labor troubles among Iron workers were less threatening. No large orders are reported, but the volume of business is fully up to the average. One of the largest Plate mills represented here reports May the heaviest month in its history in the record of shipments on account of sales in this immediate territory. The Bar Iron trade is in fair condition, with prices held firmly at $1.70 at Eastern mill for Refined Iron. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates, in carload lots, are 1.85c. to 2c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.35c. upward for Fire Box. Refined Bars are 1.80c. to 2c.; Soft Steel Bars, 1.75c. to 1.90c.

Old Material.—A better feeling is developing in trade with the rolling mills, the manufacturers being now disposed to make more liberal purchases of Scrap. Some contracts, in fact, have been placed during the week for deliveries running through the last half of the year. Steel Scrap continues in excellent demand. Cast Scrap, however, is still weak, owing to the unsettled condition in the Pig Iron market. We quote, f.o.b. cars, vicinity New York, per gross ton, as follows:

Old Iron Rails	$23.50 to $24.00
Old Steel Rails, long lengths	22.00 to 22.25
Old Steel Rails, short pieces	19.25 to 19.50
Relaying Rails, heavy sections	27.00 to 28.00
Relaying Rails, lighter sections	29.00 to 30.00
Old Car Wheels	19.50 to 20.00
Old Iron Axles	28.50 to 29.50
Old Steel Car Axles	25.50 to 26.50
Heavy Melting Steel Scrap	19.25 to 19.50
No. 1 Railroad Wrought Scrap Iron	20.00 to 21.00
Iron Track Scrap	19.00 to 20.00
Wrought Pipe	15.00 to 16.00
Ordinary Light Iron	11.00 to 12.00
No. 1 Machinery Cast Scrap	17.00 to 17.50
Stove Plate	12.50 to 13.00
Cast Borings	9.50 to 10.00
Wrought Turnings	15.00 to 15.50

W. C. Dickey, for many years with the New York office of the Cambria Steel Company, is now New York representative of the N. & G. Taylor Company, operating the mills of the Maryland Sheet & Steel Company, at Cumberland, Md. He has opened offices in the Townsend Building, 1123 Broadway, for the sale of their product, consisting of Open Hearth Plates and Sheets from No. 6 to No. 18 gauges. The Maryland Rail Company, W. C. Dickey, secretary, manufacturers of Light Rails, have also located in the Townsend Building.

The New York Machinery Market.

NEW YORK, June 3, 1903.

There has been a rather marked falling off in general demand, which is attributed to unsettled labor conditions. There seems to be considerable apprehension among smaller purchasers as to what may happen in the labor situation, and consequently they are holding back their orders. This is considered rather remarkable in the trade, as an increase rather than a falling off of business was looked for at the opening of this month. This expectation was based on the surprisingly light amount of disturbance which was experienced in the machinery industry during the month of May. Last month was universally looked upon as the time set for trouble. The trouble came in much shorter measure than was anticipated, hence machinery merchants expected purchasers to loose the strings that held their orders back as soon as the month of May had passed. Their disappointment is due to the fact that many of the purchasers who anticipated trouble that didn't materialize are still nervous over the future. Instead of taking the view that they were passed by, these employers are saying, "Our trouble hasn't come yet, therefore we shall wait."

Fortunately this is not the case with large corporations who are contemplating improvements. The big work is moving right along; slowly, as it always does, but uninterrupted.

It is gratifying to note that the St. Louis trouble is over. In New York and vicinity there is very little disturbance. The demands made by machinists in marine shops were refused by the employers. As we have previously stated in these columns, the demands were to go into effect June 1. The refusals of the employers to accede met with strikes in only a few of the shops in which the demands were made. These are located in the Borough of Brooklyn. It is believed that test cases are to be made of these shops, and that the men in other shops will govern themselves according to the outcome.

The largest machine tool purchase that has been made for some time has just been consummated by the Chicago, Rock Island & Pacific Railroad. The proposition included upward of $200,000 worth of machinery. Practically the entire equipment was awarded to the Niles-Bement-Pond Company. The Lackawanna list is being disposed of gradually. Some purchases have been made, but the bulk of the machinery remains unclosed. The Mobile & Ohio Railroad have a large list out. The tools will be used in extending the company's shops at Mobile. R. H. Duesberry of Mobile, Ala., is the purchasing agent. Purchases are being made by the Chicago, Burlington & Quincy Railroad, who are in the market for additional machinery equipment.

The Niles-Bement-Pond Company were awarded the contract for the entire machinery equipment to be installed in the new construction and repair building at the New Orleans Navy Yard. As previously mentioned in *The Iron Age*, their bid was $91,653.

Members of the trade are looking for a good sized machine tool list which they expect to receive from the Singer Mfg. Company. The latter concern intend adding very materially to their Elizabethport plant. Plans for the new buildings have been completed by Architect David B. Provoost of Elizabeth, and bids have been received for the construction of the buildings. We are informed that there are to be three buildings, the principal one being 500 feet long and approximately 175 feet wide and four stories in high. The additional buildings, we understand, are to be equipped with the same lines of machinery which are now in use in the various parts of the works, being for the purpose of increasing the general product.

Some time ago we announced that the Ridgway Machine Tool Company intended erecting a large plant at Ridgway, Pa., for the building of lathes, planers, boring mills and heavy machine tools. We are now advised that this work is well on toward completion, and that the officers of the company are hopeful of having the plant in operation by October 1. The company were incorporated in 1902, and are composed of the following officers: H. R. Hyde, president; P. R. Smith, vice-president; Lewis H. Morgan, superintendent; J. E. Logan, secretary; E. C. Powell, treasurer. The capital stock of the company is $300,000. The plant which is now in process of erection will consist of six buildings located in the eastern part of Ridgway, near the Pennsylvania Railroad, with which they will be connected by two sidings. The machine shop is to be 112½ x 225 feet and the other buildings as follows: Erecting shop, 75 x 225 feet; foundry, 112½ x 150 feet; steel storage and forge shop, 75 x 150 feet; pattern shops and storage, 75 x 150 feet; engine and boiler house, 37½ x 37½ feet, and a tool house of the same dimensions and three stories high. Later a separate building will be erected for offices and drawing rooms. A considerable quantity of equipment, consisting of the latest types of machine tools, has been purchased and orders are now being placed for the balance of the equipment. There will be 13 overhead electric traveling cranes, ranging from 5 to 40 tons capacity each, placed in the various buildings.

From $50,000 to $75,000 worth of machinery is required by the Wheel Within Wheel Company, Park Row Building, New York, who have purchased a site in Lancaster, Pa., where they are to erect a large plant for the manufacture of automobiles and their patent wheels. Plans are now in the engineer's hands and no details as to construction and size of buildings are available, but we are informed that the buildings, exclusive of equipment, will cost in the neighborhood of $60,000. No contracts have as yet been placed. The company are reorganizing and will be known as the Conestoga Automobile & Wheel Company. The officers are: President, George Pope, vice-president of the American Bicycle Company; vice-president, L. M. Gardenshire, and treasurer, A. E. Martinsen.

It is expected that requisitions for the machinery for the new steel tank car shop to be erected at Buffalo, N. Y., by the Standard Oil Company will shortly come through their New York office. We understand that the equipment has not yet been purchased. The building will be 101 x 211 feet.

We are advised by the Kenton Hardware Mfg. Company, Kenton, Ohio, that they are ready to receive bids for machinery belting, shafting, pulleys—in fact, a complete line of mill supplies and plating outfits, to replace that destroyed by fire May 20. At that time their plant was almost burned to the ground, causing a loss of $100,000.

The Bureau of Equipment, Navy Department, Washington, will receive bids until July 15 for a complete coaling plant for the Narragansett Bay coal depot, Bradford, R. I. R. B. Bradford is chief of bureau equipment.

Rowbottom Machine Company, Waterville, Conn., manufacturers of special automatic machinery and grinders, are ready to let the contract for the building of a brick addition to their plant, 40 x 120 feet, one story. New machine tools, such as planers, lathes, drills, &c., will be purchased for the new building.

Equipment for a large new foundry is being purchased by the Babcock & Wilcox Company, whose principal offices are located at 85 Liberty street, New York, and whose plant is in Bayonne, N. J. The new foundry is to contain duplicate equipments and is to have a capacity of 72 tons daily.

The Alberger Condenser Company of 95 Liberty street were awarded a contract for a large central condenser system to be installed in the Ohio works of the Carnegie Steel Company at Youngstown, Ohio. This plant is to be installed in conjunction with a new blowing engine plant to supply furnaces No. 3 and No. 4. The plant will contain four blowing engines of an aggregate of approximately 1600 horse-power. The condenser plant will be of the high vacuum type, using the Boshwater for condensing purposes. The condenser will include Corliss air and circulating pumps.

The American Coke & Gas Company of 17 Battery place, New York, who were formerly known as the United Coke & Gas Company, are now in the market for the entire equipment of two large gas producer plants, one to be located at Johnstown, Pa., and the other at Duluth, Minn. These will be built according to the Otto-Hoffman system. It will be recalled that this concern installed plants of this type in connection with the new Buffalo plant of the Lackawanna Steel Company, and also in the various plants of the Sharon Steel Company and Maryland Steel Company.

Vieillard & Osswald, 93-97 Pearl street, Brooklyn, N. Y., manufacturers of the V. & O. line of presses, have recently incorporated as the V. & O. Press Company. The officers of the new company are as follows: Allen Bole, president; Martin McVoy, vice-president, and Herman Osswald, secretary and treasurer. Among the leading stockholders are Frederick R. White of the White Sewing Machine Company and T. B. Little of the Baker Motor Vehicle Company, both of Cleveland, Ohio. The old firm of Vieillard & Osswald have built up a reputation for turning out strictly high grade machinery, which should pave the way for a greatly increased output by the new company.

The Cramp Shipbuilding Company.

The William Cramp & Sons Ship & Engine Building Company have issued the following statement of earnings for the year ended April 30 last:

Gross, $8,518,169; total gross profit, $606,497; from which deduct $113,866 for general expenses and legal services. Taxes, interest and insurance consumed $282,233, leaving the net earnings $300,397. Two quarterly dividends required $121,200, and $179,197 was transferred to profit and loss account, which at the end of the year amounted to $4,322,803, compared with $4,143,606 the previous year. The plant is valued at $12,577,821 and the total assets are fixed at $15,531,405. The total liabilities, including the $4,848,000 of capital stock, are $11,208,602. That leaves a surplus in assets of $4,322,803.

In reference to the $5,000,000 5 per cent. bonds, recently issued, the report says: "For the purpose of enabling the company to carry out the terms of the agreement a special meeting of stockholders will be held June

25 to vote for or against an increase in the capital stock from $5,000,000 to $6,250,000 and of the mortgage indebtedness from $1,800,000 to $7,500,000."

The Weston Employees' Club.

A social movement embodying important features of originality and launched under most favorable auspices has been inaugurated among their employees by the Weston Electrical Instrument Company of Waverly Park, N. J. The salient feature which marks this enterprise and distinguishes it from similar efforts is the perfect freedom granted to the men by their employees. In fact the men are to manage and operate the entire affair themselves. In constructing their fine new works at Waverly Park the company planned one of the large buildings with the view of providing quarters for the proposed Employees' Club. At present these quarters occupy two floors of the building, the latter being so designed, however, that as the social work grows additional room can be placed at the disposal of the men. The rooms and fittings have been turned over to the men and their organization is now being completed for the purpose of carrying out the work in a systematic and businesslike manner.

Formal Opening.

On Friday evening, May 22, the company tendered a reception to their employees and their wives, sweethearts and friends, in the course of which Prof. Edward Weston, the president of the company, father of the many ideas embodied in the entire plant for the physical and social betterment of the employees, formally turned the rooms and appurtenances over to the employees. The occasion was a very happy one, about 1000 guests being in attendance. The early part of the evening was devoted to a good musical and literary programme, contributed by the employees, after which there was dancing and a very elaborate banquet served in the new dining rooms.

In turning the club rooms over to the men, Professor Weston made a very strong address in which he outlined the benefits which would accrue from a thorough understanding and co-operation between the employer and his employees. He said that the men were not brought sufficiently in contact with the general business affairs of the company and that he believed that the proposed Employees' Club would furnish means of accomplishing this. He outlined some of the little business points which, if brought to the attention of the men in a friendly way, would acquaint them better with the true conditions under which both employee and employer must labor, and showed how advantageous it would be to all concerned if the men were to be kept in a closer knowledge of these conditions. He stated that he did not think it wise, however, for a manufacturer to inaugurate such a movement as was being started and then attempt to run it independent of the ideas of the men. He believed that a course directly opposite to this would accomplish the ends sought and foster the truly friendly relationships which he desired to have always exist between himself and his employees. He said that he purposed turning the entire affair over to the employees, who would be allowed to operate it according to their own ideas and experiences. The company, he said, however, stood always ready to give whatever assistance they could whenever they should be called upon. The administration of the affairs of the club, he argued, would give the men executive experience which would prove valuable to them in their business career. He outlined the special features of the work, laying special stress upon the educational facilities which are to be offered in the way of lectures, libraries, &c.

Dr. A. O. Benecke, chief electrician of the works, replied to Professor Weston's remarks in a very enthusiastic manner in behalf of the employees. After thanking the company for their generous gift and ,praising the liberality and kind consideration which the company have always tendered their men, he presented a handsome silver loving cup to Professor Weston, in the name of every one of the employees.

The Club Rooms.

These occupy the first and second floors of a building 38 feet wide and about 200 feet long, together with the second floor of a wing extending at right angles, and making the entire length of the second floor about 387 feet. This floor is to be used as a dining room, and has a polished maple floor with fire proof wood fittings and ceilings and tasteful decorations. It is well lighted, numerous large windows being placed on both sides, and in addition there are numerous clusters of incandescent electric lights. At one end of the room there is a platform on which a handsome piano has been placed, which is the gift of Professor Weston to the club. In the northwest corner of the room are two smaller dining rooms partitioned off for the staff. In this way the members of the company and heads of departments will gather at a great "round table," and the other employees will thus be allowed to dine by themselves, being free from any embarrassment which might exist if their employers or department heads were in their midst.

The Employees' Club are to have entire charge over the dining room. They will purchase the necessaries and fix the price at which the dinners are to be served to all the men. The primary object, of course, will be to furnish as good a dinner as possible at the lowest price. To set this price and cook and serve the meals will be functions of the club. If there is any dissatisfaction as to the service, or quantity or quality of the meals, the men will have to look to their own House Committee for the remedy, and if any profit accrues from the maintenance it will be referred to the club. In this way the men will have no opportunity to lodge a complaint against the company, nor will they get a notion that the company are endeavoring to make money from the project. The main dining hall contains 40 polished cherry top tables, each to seat eight persons. The 300 chairs are numbered to correspond to numbers given the individuals, each person being assigned to a certain seat at their designated table. Bills of fare will be distributed through the various departments during the morning, and each employee, being designated by number, will check off the viands he desires. The cards will be collected, and shortly before the noon hour waiters will assemble in the dining room and serve the dinners ordered, placing them so that there will be no delay when the diners arrive at the table. The dinners will consist of soup, a choice of several kinds of meat, two or three vegetable dishes and dessert, and coffee, tea or milk. While the cost of this has not been definitely determined upon, the House Committee of the club will endeavor to provide it for 15 cents. The company have presented the club with a complete equipment of silver plated ware of special design and table ware enough for the service of 300 diners. Each piece is marked with the monogram of the club. Adjoining the dining room is an excellently appointed modern kitchen, with ranges, boilers, steamers, steam tables and every appliance required for the preparation of an elaborate meal on a large scale. In the main room there are serving tables, dish warmers, &c. Below the kitchen, which contains a refrigerator equipped with refrigerating coils, there is a large refrigerating plant and ice machine. This plant supplies the cold water for drinking purposes throughout the plant, and makes ice for use in the club and in the shops.

Swimming Pool.

The main floor of this building is depressed somewhat below the ground level and contains the bathing facilities. One of the largest swimming pools in this country is furnished the men in this department. It is 150 feet long and about 20 feet wide. Its bottom is sloping, from 4 feet on one end to 8 feet at the other. This entire room and the pool are built of tiling, marble and cement, so that it can be subjected to a thorough flushing by means of hose periodically. The swimming tank is so arranged that its contents can be used for fire fighting purposes if necessary. In other words, the storage tank, which would otherwise have been placed on the top of the building, is used to good advantage as a swimming tank. On one side of this room there is a long row of individual bathrooms, containing porcelain tubs and shower baths.

These are to be used by the men before taking a plunge in the swimming tank.

Another room in this building is devoted to the regular washrooms and lavatories for the employees. Adjoining this room is also a locker room, which is equipped with metal lockers, each employee having one.

A complete technical library will be provided on the second floor of the building, together with a reading room containing all of the best periodicals. Efforts are now being made to have the clubroom designated as one of the distributing stations of the Newark Free Library.

While the work is still in its infancy, every means is afforded for making this one of the most successful, if not the most successful, movements of this kind ever attempted in this country. The ideas embodied in the construction of the building are the result of elaborate study and preparation, considerable time and money having been extended in investigating similar projects in other sections of the country. A high class of mechanics is employed by the company, and they are going about their new work in a very intelligent manner and promise to conduct their club along the ideal lines conceived by Professor Weston.

The Western Revised Bar Iron Scale.

At the conference held in Detroit, Mich., last week between representatives of the Republic Iron & Steel Company and the Amalgamated Association of Iron, Steel and Tin Workers a revised scale was adopted to govern wages paid in puddling and finishing mills for the year commencing July 1, 1903, and ending June 30, 1904. The scale of wages governing the rates paid during the current year was adopted with a number of changes, which are given in detail, as follows:

The rate to be paid on boiling continues on the old basis of $5 when bar iron is selling at 1 cent per pound. The schedule is maintained until the selling price of 1 7-10 cents is reached, when an advance is made from the old rate of $6.12½ to $6.25; 1 8-10 cents is advanced from $6.25 to $6.50; 1 9-10 cents, from $6.37½ to $6.75; 2 cents, from $6.50 to $7.

Paragraph 4, under "Boiling," in the old scale reads: "Where Bessemer pig iron is worked alone, $1 per ton extra shall be paid." A new paragraph has been substituted, as follows: "That when iron containing 60 per cent. or more Bessemer is worked, $1 per ton extra shall be paid."

Paragraphs 12, 13 and 14 have been changed. The old scale reads as follows:

12. Fifty cents per ton extra for all metal boiled, also for swarth and turnings worked on clay or hot cinder fix.

13. For all light scrap worked alone in a boiling furnace the same price shall be paid as that for working wrought iron turnings; this to cover all light sheet, hoop No. 19 and lighter, and wire No. 5 and lighter; this scrap to be cut from 8 to 10 inches in length for charging.

14. That the puddlers and boilers be paid for all blooms and sliders equivalent to 490 pounds where the charge is 500 pounds per heat, when it is no fault of the boiler.

The paragraphs as amended are:

12. Fifty cents per ton extra for all metal boiled, also for swarth and turnings worked on clay or hot cinder fix.

13. For all light scrap worked alone in a boiling furnace the same price shall be paid as that for working wrought iron turnings; this to cover all light sheet, hoop No. 19 and lighter, and wire No. 5 and lighter; this scrap to be cut from 8 to 10 inches in length for charging and placed not more than 10 feet from charging doors.

14. That the puddlers and boilers be paid for all blooms and sliders equivalent to 490 pounds where the charge is 500 pounds per heat, and 535 when the charge is 550 pounds, and 1070 pounds when the charge is 1100 in a double furnace, when it is no fault of the boiler.

Paragraph 26 has been changed. In the present scale it reads: "In case of breakdown in muck mill, 45 minutes shall be the time (from the time the furnaces are ready to draw) to wait for the same to be repaired, and when heats must be thrown out the company shall bloom same, if possible." It now reads as follows: "In case of breakdown in muck mill, 45 minutes shall be the time (from the time the furnaces are ready to draw) to wait for the same to be repaired, and when heats must be thrown out the company shall bloom same, if possible, and if bloomed the company shall pay for the same."

A new paragraph has been added under this heading, as follows:

29. When more than 10 per cent. of each charge on cinder bottom furnaces is galvanized sheet scrap, $1 per ton extra shall be paid.

Under the head of "Muck or Puddle Mill," paragraph 1 has been changed. In the present scale this paragraph reads: "The price per ton of 2240 pounds to be paid for muck rolling on trains of two pairs or sets of rolls, or less, shall be one-seventh the base price for boiling, but the roller to pay all labor in taking iron from squeezer and delivering upon bank straightened, except bloom boy. In such case, where a bloom boy is used, the manufacturers hereby agree to pay one-half the wages paid to said bloom boy." The new paragraph is as follows: "The price per ton of 2240 pounds to be paid for muck rolling on trains of two pairs or sets of rolls, or less, shall be one-seventh the price for boiling, but the roller to pay all labor in taking iron from squeezer and delivering upon bank straightened, except bloom boy. In such case, where a bloom boy is used, the manufacturers agree to pay one-half the wages paid to said bloom boy."

Under the heading, "Busheling on Sand Bottom," paragraph 3 has been changed. In the present scale it reads: "Pipe scrap over 4 inches in diameter shall be cut from 4 to 6 inches in length before charging." It is now as follows: "Pipe scrap over 4 inches in diameter shall be cut from 4 to 6 inches in length, and all heavy scrap shall be cut not more than 8 inches in length before charging."

Paragraph 7 has been changed. In the present scale it reads: "That when light scrap is worked without turnings, 20 cents extra above light scrap price shall be paid." The new paragraph is as follows: "That when light scrap is worked without turnings, 20 cents extra above light scrap price shall be paid, but if turnings cannot be secured through inefficient railroad facilities the extra price does not apply."

Paragraph 8 has been changed. In the present scale it reads: "That when heavy scrap is worked alone on sand bottom without turnings, the price to be 20 cents above the price for busheling." The new paragraph is as follows: "That when heavy scrap is worked alone on sand bottom without turnings, the price to be 20 cents above the price for busheling, but if turnings cannot be secured through inefficient railroad facilities, then the extra price does not apply."

The following new paragraphs have been added under this heading:

9. That scrappers shall lose only the amount over the limit of a ball when the scrap is not weighed in for each charge.

10. All blooms and cobbles, of whatsoever character, worked in a sand bottom busheling furnace shall be paid for at the straight price paid for busheling heavy scrap.

11. When more than 10 per cent. of each charge on sand bottom furnaces is galvanized sheet scrap, $1 per ton extra shall be paid.

Under the heading of "Heating Slabs and Shingling," paragraph 2 in the present scale has been stricken out. It reads as follows: "The company to pay hooker on all iron over 300 pounds."

Under the heading of "Bar Iron and 12-inch Mills," paragraph 8 has been changed. In the present scale it reads: "When crop ends run excessive lengths, an effort shall be made by the management to correct the abuse, but when said excessive crop ends are sold as finished material at any later period full scale prices shall be paid." It is now as follows: "When crop ends run to excessive lengths an effort shall be made by the management to correct the abuse, but when said excessive crop ends are sold as finished material at any later period, full scale prices shall be paid. All fagots or scrap piles shall be piled on scales, and an effort be made during the year to arrive at an equitable percentage."

A change has been made in paragraph 12, which reads as follows in the present scale: "Company shall pay not less than one-half the fireman's wages on coal heating furnaces." As changed, this reads: "Company shall pay not less than one-half the fireman's wages on coal heating furnaces, excepting where present practice requires full payment."

A new paragraph, No. 15, has been added, as follows: "That two hours shall be the limited time for holding

heats in heating furnace after hot, where it is no fault of heater, but if at the request of manager the heat shall be held longer, 10 per cent. shall be paid to the crew for the heat."

The table of wages under the heading of "T Iron" has been slightly changed on sizes 1½ and upward. On these sizes the new rate for roller is $1.33, against the old rate of $1.34; heater, 66½ cents, against 67 cents; rougher and catcher each, 36¼ cents, against 35½ cents. Precisely the same changes have been made on size ⅝-inch in table of wages for "Clip and Wagon Strap," and for ½ and 9-16 rounds and squares on "10-inch Mill."

Under the heading of "Half Oval," paragraph 1 has been changed. In the present scale it reads: "On mills working steel exclusively, 2½ per cent. less than above prices for roughing and catching." The new paragraph reads as follows: "On mills working steel exclusively, 2½ per cent. less than above prices for roughing and catching each."

Paragraph 7 has been changed. In the present scale it reads: "Where 10-inch guide, hoop and cotton tie mills average $32 or more per turn, an extra rougher shall be employed to assist both rougher and catcher, during the months of June, July and August; the same to be paid one-half by roller and one-half by rougher and catcher." The new paragraph is as follows: "Where 10-inch guide, hoop and cotton tie mills average $32 to $46 per turn, such mills shall constitute a two-man job on roughing rolls with an extra man for June, July and August, and when mills average over $46 to $67 it shall constitute a three-man job with an extra man for June, July and August; over $67 it shall constitute a four-man job, with an extra man for June, July and August. The following shall be the method of determining what roller shall pay for extra rougher: One-sixth the wages of rougher and roughers up wages on two-man job, and on three-man job, or more, one-seventh. Roller to pay no part when the extra man is not put on."

Paragraph 16 has been changed. In the present scale it reads: "Company shall pay not less than one-half the fireman's wages on coal heating furnaces." The new paragraph is as follows: "Company shall pay not less than one-half the fireman's wages on coal heating furnaces, excepting where present practice requires full payment."

Under this heading three new paragraphs have been added, as follows:

17. That where the loss to crew, through working inferior material (such as too much hard or high carbon steel mixed in piles) exceeds one-sixth, the same shall be paid by the company.

18. That two hours shall be the limited time for holding heats in heating furnace after hot, where it is no fault of the heater, but if at the request of manager the heat shall be held longer, 10 per cent. extra shall be paid to the crew for the heat.

19. That the tread or base measurement of cushion and channel tire be the size at which the same shall be paid for according to channel iron scale.

St. Louis.

CHEMICAL BUILDING, June 3, 1903.—(*By Telegraph.*)

Pig Iron.—The Pig Iron situation at this point is unchanged and affairs continue to drag along in a listless sort of way. Very little inquiry is coming to hand, and if it were not for an occasional carload order the market would certainly be a dead one.

Bars.—Some little new demand has come to the market for both Iron and Steel Bars and business has been on a very steady basis. Jobbers are handling a good store trade. We quote from the mills Iron Bars at 1.80c to 1.85c.; Steel at 1.82½c. to 1.87½c. Jobbers name 2.15c. in lots from store for both Iron and Steel.

Rails and Track Supplies.—Market conditions are generally steady, with the volume of new inquiry well sustained. We quote as follows: Splice Bars, 2.05c. to 2.25c.; Bolts, with Hexagon Nuts, 3.05c. to 3.25c.; Bolts, with Square Nuts, 2.90c. to 3.05c.; Spikes, 2.20c. to 2.30c. Jobbers' quotations 10c. to 15c. higher from store.

Pig Lead.—While the Pig Lead market continues quiet, the undertone is very steady and prices are holding firm. Missouri brands are quotable at 4.15c. to 4.17½c.

Spelter.—Very little change is to be reported in the Spelter market, and the conditions of prices and demand remain firm and steady. Spot metal is quotable at 5.50c., with future deliveries at 5.40c.

Metal Market.

NEW YORK, June 3, 1903.

Pig Tin.—After a steady decline in price which brought spot here as low as 27½c. a sharp reaction set in yesterday, carrying prices to a point a little higher than they held last week. The better showing of the monthly statistics is given as the cause of the rally. The improvement marked transactions both here and abroad. At the close to-day this market is firm at 28½c. to 28¾c. for spot to June delivery. London declined to £124, and to-day has recovered to £129 for spot and £127 for futures. Business from consumers has not improved. While at this writing the New York quotation is higher than that of a week ago, it will be noted that the London price is still below that quoted last Wednesday. During the month of May deliveries into consumption were very large, amounting to 4200 tons. The total increase for the first five months of this year is now 4000 tons, as compared with the same period last year. The deliveries of London and Holland during the first five months of this year show a decrease of 764 tons, as compared with the same period of last year. Shipments from Straits for May were 1420 tons larger than for the same month of last year; for the first five months of this year they show an increase of 1111 tons, as compared with the corresponding period of last year. Australian shipments during May were 11 tons over May, 1902; the total for the first five months of this year shows 539 tons more than the same period of last year. The total visible supply on May 31 is 555 tons below that of May 31 of last year, as per New York Metal Exchange returns. The total statistics for Europe and the United States show:

	Tons.
Total visible supply May 31, 1903	16,463
Against visible supply April 30, 1903	15,978
Against visible supply May 31, 1902	17,018

Copper.—The market is entirely unsettled. Producers are holding firmly to their prices and consumers are purchasing as sparingly as possible. The situation is well held by the powers in control, but, judging from the cautiousness of consumers, it is held that the stocks must be accumulating rather heavily. Comments heard in the trade regarding the preliminary statement of the production of Copper in 1902 which has just been issued by C. Kirchhoff, special agent of the United States Geological Survey, and which is printed elsewhere in this issue, indicate the opinion that according to their own figures producers have a pretty big load to carry. It is believed in the trade that the accumulation since January 1 of this year has been going on at a greater rate than the decrease noted in Mr. Kirchhoff's report. Producers' official quotations are unchanged at 14.75c. to 15c. for Lake and Electrolytic, and 14.50c. to 14.75c. for Casting. Offerings of outside lots of Casting stock were made as low as 13¾c. for the best brands obtainable. London declined to £58 10s. for spot earlier in the week, but recovered to £60 for spot and £58 5s. futures. The heavy discount still existing on futures indicates the lack of confidence maintained abroad. Best Selected declined £2 10s. to £63 10s.

Pig Lead.—Owing to free offerings of Soft Missouri at prices substantially below those of the American Smelting & Refining Company and the continued weakness abroad the trade are looking for another reduction in the "official" quotations. At present this price is unchanged, however, being quoted 4.37½c. for Desilverized in carload lots, f.o.b. New York. London has declined again, being £11 8s. 9d. to-day.

Spelter.—The metal is still held in good control by the large producers and conditions generally are unchanged. This market still quotes 5.75c. London advanced to £20 15s.

Antimony.—There has been no change. Cookson's is quoted 7½c., Hallett's 7c. and other brands 6⅝c. The market is weak.

Nickel.—We continue to quote 40c. to 45c. for large quantities and 50c. to 60c. for small lots.

Quicksilver.—The market is $47.50 for flasks of 76½ lbs.

Tin Plate.—The situation contains nothing new. The official quotation continues at $3.80 for box of 14 x 20 100-lb. Cokes, f.o.b. mill, which is equivalent to $3.99, New York. The Swansea market declined 1½ pence to 11 shillings 9 pence.

Edward Winslow, with Naylor & Co. of New York City and Pittsburgh, died in a Chicago hospital on May 29 of pneumonia. He had been connected with Naylor & Co. for about ten years, nine of which were spent in their New York office, and the past year in their Pittsburgh office as assistant to A. Krum, resident manager. A particularly sad feature in connection with the death of Mr. Winslow is that his father and mother were abroad, but are due to arrive in New York this week.

Chicago Machinery Market.

CHICAGO, ILL., May 29, 1903.

Returns from manufacturers of machinery and their agents in the Chicago territory indicate that there was a decided falling off in the volume of sales during May, compared with preceding months of the current year and the corresponding month a year ago, although there were certain notable exceptions to the rule. The decreased business was obviously more in the line of machine tools than in other departments. To labor strikes, both present and prospective, has been attributed the unsatisfactory trade, and upon the settlement of labor difficulties alone the future of the market seems to depend. All other conditions are eminently favorable and will, doubtless, lead to an acceleration of business and a full restoration of confidence when manufacturers are assured of a year uninterrupted by demands for higher wages, shorter hours and innovations in shop practice. It is notable that among the smaller manufacturers there is a very discouraging feeling, and many are inclined to give hospitality to pessimistic views based upon a struggle with employees brought about by unreasonable demands, which, if allowed, would so hamper the financially weaker manufacturers as to place them at a great disadvantage as compared with competitors. So deep seated is this feeling that not a few manufacturers are seriously considering a change of location.

Financial conditions have materially changed for the better during the past month, indicating less stringency in the fall than was experienced a year ago, while crop prospects are equally as good, if not better, than in 1902.

In a few lines merchants and manufacturers have overpurchased materially, but this is offset by many who have delayed purchasing enough in anticipation of lower prices, so that the general situation is sound. But for the moment many enterprises are held in abeyance. It is notable, however, that among the large interests, such as railroads, steel plants, traction companies and electric light plants, there is a disposition to go ahead irrespective of the threatening labor outlook, and the record of the month in the line of engines, steam and gas, and electric generators discloses this sentiment, a number of important contracts having been closed in the Chicago district, in the Central West, in the South and on the Pacific Coast for equipment. Among the more important recent purchases have been those of the Illinois Steel Company, the local elevated railroads and many of the steam railroads centering at Chicago, large and small companies alike; but it is important to note that there is still pending a very large volume of business in the aggregate, mainly for steam and gas engines and electric generators, covering a widely extended field. A feature of interest is that the demand for electrical apparatus is not only for lighting and traction, but for power transmission. One large contract, involving about $300,000 worth of machinery, was placed on the Pacific Coast within the past ten days, and several orders of a like character of $30,000, $40,000 and $50,000 each. Contracts for several hundred thousand dollars have been placed by local interests and fully as much, if not more, is pending. The East, however, is conspicuous as offering work in large units; the West and South offering smaller individual contracts, but in the aggregate quite considerable.

The recent city ordinance calling for suppression of the smoke nuisance in the city of Chicago has stimulated the demand for mechanical stokers, and business of this character has been quite considerable recently, with much more in sight.

One feature of interest is the demand for second-hand engines and tools, especially the former, there being a call for probably four times as much material as is available at present. Another development of interest is the extraordinary demand experienced for second hand locomotives, the supply of which is inadequate. The trunk lines seem to be not only disposing of light engines, but they are actually selling some heavy locomotives that have not made the record time desired, and are placing orders with manufacturers for powerful, high speed locomotives preparatory to establishing new speed records. In addition to locomotives, also, there is considerable traffic in second hand cars, steel bridges and other equipment to make room for high class betterments.

Shipments of machinery made during the month of May and those imminent indicate that Chicago dealers and Northwestern manufacturers are invading Eastern territory to a larger extent than ever; but Ohio, Indiana, Illinois, Michigan and the Northwest, through the Missouri River section, is now a fertile field, commercially considered. The South, too, industrially considered, is better than for years.

One important point is that the largest manufacturers of machinery are sold to full capacity for from four to eight months and the smaller producers from 30 days to three months. There are exceptions, of course, but for these there are special conditions.

Summing up the entire situation, it is evident that the labor element has within its power to make or break the prospects of continued prosperity for themselves and their employers.

Engines, Boilers and Pumps.

The Allis-Chalmers Company, Chicago and Milwaukee, secured a satisfactory number of orders for engines during the first three weeks in May, but fewer very large units than were taken in the two preceding months. Some large contracts are pending, and if offers now out are accepted, the business during the month of May will compare favorably even with April, which was the largest month in the history of the company. Railroads, steel plants, traction companies and electric light plants have been the largest purchasers, but business has been by no means confined to these industries. The labor difficulties experienced by the Chicago plants of the company have been satisfactorily adjusted, work having been interrupted but a few days. The outlook is now favorable for their harmonious working at full capacity. The Milwaukee, West Allis and Scranton plants are well supplied with orders. While the demand for mining machinery and flour mill equipment is fair and some satisfactory business has been booked, it is by no means as bright as is the outlook for engines of various types.

The Nordberg Mfg. Company, Milwaukee, Wis., say that so far strikes and other labor difficulties have not affected them to any great extent, but the increase of wages paid in their works adds fully 10 per cent. to the cost of manufacturing. They do not know that labor troubles are influencing adversely the placing of any new orders in their line. So far as they can judge the tendency is still to enlarged operations and enterprises. The orders on their books at present will keep their works running day and night from six to eight months.

The Witte Iron Works Company, Kansas City, Mo., say that while they can see a very restive condition among the labor classes in that vicinity, yet so far as their own condition is concerned they have made arrangements with their men which cover the coming year. Their representatives at several of the principal distributing points of the country inform them of the bright outlook in the way of expansion and development, and they are enjoying and expecting a large volume of trade which will keep them operating to full capacity for the balance of the year. The volume of their business in the past month will exceed that of a year ago by at least 50 per cent.

The Otto Gas Engine Works, Chicago, say that while the labor problem is a very serious one and interferes largely with trade in cities, it has no appreciable effect on their business outside of town. Railroads are buying liberally and the material market is in fair condition. They have secured all the construction work they care to have for the balance of this year.

The Anderson Tool Company, Anderson, Ind., report that they are giving most of their attention at this time to their gas engine business. Orders in this department seem to be plentiful, although some difficulty is experienced in securing prompt shipment of material.

The S. Freeman & Sons Mfg. Company, Racine, Wis., say that there has been very little labor difficulty at Racine and none at all in their business. They have advanced the wages of their workmen, which is customary for them to do about April 1. In their opinion wages are at least 30 per cent. higher than they were four years ago, with the cost of the manufacturing articles higher by that much than they were at that time. It is evident that the high price of labor at the present time is interfering with the placing of new contracts and causing the abandonment of contemplated improvements, this fact being noticeable in their own city. The orders for boilers and other goods in the boiler line seem to come from all classes of business, no particular branch being more conspicuous than another. The company are booked ahead with enough orders to keep their plant going to full capacity for at least three months, and are expecting to close contracts for some good business soon which will keep them busy for the balance of the year, even if they get nothing more. They think that their sales during the month of May were greater than ever before for the same month. Their foreign trade has almost entirely fallen off during the past two or three years, owing, they believe, to the increased cost of manufactured goods.

The Fuller & Johnson Mfg. Company, Madison, Wis., re-

port that they have not yet had any serious difficulty with labor, but they have been obliged to pay somewhat higher wages, which will increase the cost of their product accordingly. Business during May was below that of the corresponding month last year, but crop conditions generally throughout the Northwest are favorable and prospects for business are fairly good, although they are inclined to think that supplies in the line of agricultural implements are fully up to the requirements of the trade.

The Union Steam Pump Company, Battle Creek, Mich., say that although their business continues about the same, there is an indication of a change in the near future. They believe that the advance in freight rates and in the cost of iron and steel and other raw material is having a detrimental effect on the manufactured goods. The foreign trade seems to be changing, although sales for the present year compare favorably with those of a year ago. The uncertainty in regard to labor troubles is causing a good many to hold off who were contemplating making improvements.

The Camp Engineering Company, Chicago, report that sales of second hand engines during the month of May were relatively small, which was due, however, rather to inability to obtain the machinery than to the lack of demand. In fact, the demand has been active and urgent for engines running from 75 to 500 horse-power capacity. There is a great deal of business pending, but even where the proper sized unit is available there is now a disposition to delay purchasing until settlement of labor difficulties. With these out of the way the offerings of second hand engines can readily be disposed of. The following is a list of shipments made during the past few months: A 50 horse-power Armington & Sims to Carbon, Ind.; a 50 horse-power Ideal to Duluth, Minn.; two Westinghouse engines of 60 horse-power and 75 horse-power to La Harpe, Kan.; a 60 horse-power Westinghouse at Chicago; a 70 horse-power McEwen to Lost Nation, Iowa; a 35 horse-power New York Safety at Chicago; a 150 horse-power Buckeye and a 50 horse-power Westinghouse to Sault Ste. Marie, Canada, and a 100 horse-power Hamilton Corliss to Weleetka, Ind. Ter.

The Gardner Governor Company, Quincy, Ill., say that the machinists in Quincy have now been on strike for the past six weeks. They find the demand for goods is lessening continually and believe that labor troubles are largely responsible for it. Business during the month of May has been less than during any month of the present year and the total orders on hand will not keep them running to exceed 30 days. No change is noted in the condition of their foreign trade.

Machine Tools.

The B. F. Barnes Company, Rockford, Ill., say that they have had no strikes nor been seriously troubled through labor difficulties, although they are now paying higher wages than ever before. They do not believe that there is in sight any tendency toward a reaction in their line of business. Orders already booked will keep their plant busy three to four months. Shipments during May will equal and possibly exceed those of April and by far overrun their sales of May, 1902. Their foreign trade has not essentially changed during this month, though they have not so far received quite as many orders as they did during April.

Hill, Clarke & Co., Chicago, say that they have felt the effect of labor troubles to some extent, but in spite of this their business has been very good during the last few weeks. If the manufacturers were assured of no trouble with their employees their business would be considerably increased. They report that so far they have had no particular difficulty in getting goods from the manufacturers.

The Geo. Whiting Company, Chicago, say that while business in general seems to be all right, yet in the last month or two they have noticed a holding back of orders to determine what effect labor controversies will have on the future. These orders are for machines needed for legitimate wants. If the labor sky clears in the next month or two they anticipate a large demand from all over the country.

McDowell, Stocker & Co., Chicago, report that while they have secured a fair number of small orders for machine tools during the month of May, the volume of business is unsatisfactory as compared with the preceding months and the record of a year ago. The unreasonable attitude of labor has brought about this condition, and until a full settlement is arrived at but little substantial increase in business is anticipated. However, there is considerable trade in sight which will lead to substantial orders when a settlement of manufacturers' difficulties with labor is made. A few important local manufacturers, who have made settlement with their help during the past few days, have again entered the market and placed a number of desirable orders for small tools. Among such are the implement manufacturers.

The American Machinery Company, Grand Rapids, Mich., report that the recent labor troubles have undoubtedly caused a hesitation on the part of many manufacturers with regard to placing orders for machinery, but they have had no orders countermanded on this account. They have sufficient orders on hand to insure the operation of their plant to its fullest capacity for some months to come, and believe the conditions are to continue the same in this respect for some time. They have been forced by higher costs to advance prices on a few of their machines, and feel that they would be fully justified in doing the same to their complete line. Railroads and steel plants are still their largest customers, but they are in receipt of very satisfactory orders from other machinery manufacturers. They report an unusually large number of good contracts pending which are expected to be closed at an early day. Considerable improvement in trade is reported from their branch office in England. Quite a large shipment is being made to Johannesburg, South Africa, and a fair sprinkling of orders has been received from other countries. Sales for the month of May show an increase over other months of this year and a 50 per cent. increase over the same month last year.

Manning, Maxwell & Moore, Chicago, say that trade in machine tools during the month of May has fallen off materially, and, as compared with the large volume of business transacted in April, the May orders seem insignificant. The sharp falling off in business is attributed to the labor strikes which have already occurred and which are now threatening, there being a disposition among manufacturers to await the outcome of pending difficulties before placing orders for new tools. There is a large volume of business pending, however, both in the East and West, and while it now seems probable that this will be held in abeyance until fall, if labor difficulties are speedily settled a material increase in buying will be experienced during the summer. All depends upon the labor difficulties. Railroads and several local manufacturers have placed moderate sized orders for tools during the past few days.

The J. H. Dawson Machinery Company, Chicago, report that business in machine tools during the month of May has not only shown a decided decrease as compared with preceding months of the current year, but sales suffer in comparison with May, 1902. A number of small tools and several large units have been placed during the month, mainly with small manufacturers for renewals, but there have been a few orders for full shop equipments. The labor difficulties are entirely responsible for the decrease in business and upon their settlement depends the immediate future. An estimate has been made, showing 80 firms in Chicago, and within a radius of 40 miles, who are contemplating the placing of orders for machine tools; but with scarcely an exception all have expressed their determination to await the settlement of labor difficulties. The result is that road agents are returning home to pursue the same waiting policy, the cultivation of the present barren field being worse than useless. Some recent sales have been made to cement plants, machine shops and bridge companies.

The Fox Machine Company, Grand Rapids, Mich., say that at the present time the demands of labor are not interfering in any way in the fulfilling of their contracts. They are very agreeably surprised at the way orders keep coming in, notwithstanding the strikes and labor troubles in different parts of the country; while it has not affected them as yet, they expect to feel it a little later on. Their purchasers are dispersed over the whole world and among all classes of people, and the closing up of any particular branch of business is not felt as it would be if they were dealing entirely with such a branch. They have no large contracts, however, on hand, their business being of such a nature that shipments go out in small quantities. Their foreign trade was very satisfactory, the volume of sales for May being 65 per cent. in advance of what they were a year ago.

Chas. H. Besly & Co., Chicago, judge from the number of orders they are receiving that their customers are not having any labor troubles. They report a great many small shops starting up in various parts of the country. Their trade from the automobile manufacturers is increasing daily, many new shops being established for manufacture of automobiles and many shops in this line are having difficulty in filling their orders. They recently have made large shipments to the Pacific Coast of Helmet oil, which is used there principally on agricultural implements, while Atlantic coast shipments of oil are to supply the automobile trade. Badger and Bonanza cups are being ordered for farm implements, such as disk plows, corn shredders, wind stackers, traction outfits; also for hoisting and conveying machines and ore docks. Recent shipments of Gardner grinders have been made to New York, Pennsylvania, Ohio, Wisconsin, Michigan and California. Cablegram repeat orders for several machines were received from Vienna, Austria, on the 26th ult. All departments at the Beloit, Wis., factory are busy, and difficulty is still experienced in obtaining the higher grades of tool steel, also in getting malleable iron. The company will exhibit their new Helmet temper taps and Gardner grinders under power at the Master Car Builders' and Master Mechanics' convention at Saratoga Springs, N. Y., June 24 to July 1, under the direction of representatives from the Chicago store and the Beloit factory.

The Armstrong Bros. Tool Company, Chicago, report not having been affected by strikes or other labor difficulties, and the large business which they are doing indicates that the labor situation is not such as to interfere seriously with the machinery manufacturers and general machine shops, who constitute a large body of their customers. They say

that business for the month of May will compare very favorably with any month in their experience, as they have had not only a very heavy trade in their tool holders, but have booked heavy orders for their new ratchet and also for their new machine for cutting off self hardening steel. They have noted a marked revival in foreign trade, which is at present very satisfactory.

The Ransom Mfg. Company, Oshkosh, Wis., state that February, March and April were by far the heaviest months they had ever experienced. With the advent of May and during that month a decided lull came on, attributed to the unsettled conditions of labor, and business fell below that transacted even during the corresponding month of last year. Orders booked ahead, however, are sufficient to keep their plant busy from 60 to 90 days. The company have several contracts pending which they expect to close during June and which, if consummated, will give them a good volume of business for the summer.

The Wilmarth & Morman Company, Grand Rapids, Mich., report that shipments during May were a little in advance of those made in April and also in May last year. Sales of their drill grinders to railroads continue satisfactory. No change has been experienced in foreign trade. Shipments of their product during the month of May are partially as follows: Dry grinders—Cincinnati Car Company, Cincinnati, Ohio; Marine Hardware & Equipment Company, South Portland, Maine; Pacific Mills, Lawrence, Mass.; Springfield Road Roller Company, Springfield, Ohio; Arnold Print Works, North Adams, Mass.; E. I. Du Pont de Nemours, Wilmington, Del.; Wm. Broadhead, Jamestown, N. Y.; Richard Borden Mfg. Company, Fall River, Mass.; Anderson Bros., Jamestown, N. Y.; Art Metal Construction Company, Jamestown, N. Y.; Nova Scotia Steel & Coal Company, Limited, Sydney, N. S. (motor driven); E. & B. Holmes Machinery Company, Buffalo, N. Y.; Trevor Mfg. Company, Lockport, N. Y. (two); three to England, one to China, four to Canada, and one to Scotland. Wet grinders—Ridgway Dynamo & Engine Company, Ridgway, Pa.; Brown & Thomas, Erie, Pa.; King Machine & Tool Company, Cincinnati, Ohio; Northern Pacific Railway shops at Brainerd, Minn., Gladstone, Minn., and Glendive, Mont.; Crane-Hawley Company, Cincinnati, Ohio; Pittsburgh, Cincinnati, Chicago & St. Louis Railway shops at Logansport, Ind.; Lombard Iron Works & Supply Company, Augusta, Ga.; Morton Mfg. Company, Muskegon, Mich.; Wegner Machine Company, Buffalo, N. Y., and four machines to Canada. Shipments have also been made of their arbor presses and friction countershafts.

Special Machinery.

The Marinette Iron Works, Marinette, Wis., state that they are at present experiencing no labor difficulties or strikes, nor do they apprehend any. They feel, however, that the existing conditions throughout the country, the many strikes now in effect and those pending, are having a very serious effect upon contemplated improvements and in many cases causing their abandonment. They have at present sufficient orders and contracts booked to keep their plant fully employed for about four months.

The Holthoff Machinery Company, Cudahy, Wis., have had no trouble with their employees and hope to be free from such difficulties. However, the numerous demands made by the labor organizations throughout the country are so far reaching in their effects that it is impossible to predict what the result is going to be, or how soon the conditions may be such as to make it almost impossible to do business. The company have contracts booked sufficient to keep them running to full capacity for four or five months, and they have several large contracts pending, with inquiries coming in daily. They have not as yet made any great efforts to secure foreign trade, as they have had all they could do at home. There are many inquiries, however, coming to them from other countries, and they hope to obtain a share of the business.

The Webster Mfg. Company, Chicago, say that the volume of their business is ahead of last year, both in amount of orders booked and work they have completed and shipped. They have had no trouble with labor excepting that they have had to advance prices to their employees, and have advanced prices on their product accordingly.

The Vilter Mfg. Company, Milwaukee, Wis., state that they have secured some nice additional business, and that the orders booked will keep their plant busy for a number of months, day and night, as before. The volume of sales for the month of May is considerably in excess of any of the preceding months for this year, and very much larger than the corresponding month a year ago. Generally a tendency toward a decrease in business at this time of the year up to October is experienced, but for the last few years this condition has not prevailed. They do not have much foreign trade at this time, due, they believe, to the cost of raw material and the high wages paid, which do not allow them to satisfactorily compete with foreign houses.

The Green Engineering Company, Chicago, note a continued improvement in the demand for mechanical stokers, in the sale of which the month of May compares favorably with preceding months of this year and with the corresponding month a year ago. While railroad companies and electric light plants have still been prominent buyers, the field is broadening, inquiries from and sales to various manufacturers verifying this statement. Shipments have been made recently to various points in Indiana, Illinois, Nebraska and Kansas. The outlook for the future, barring the labor situation, is brighter than it has ever been known, but labor difficulties are of a serious nature, and while a number of cases have been settled, they follow one another in such rapid succession as to unsettle business somewhat. At the present time difficulty is experienced in the assembling of castings, springs and other parts because of strikes at plants of supply houses, foundries and other industrial works. Local manufacturers have been liberal patrons of stoking machine manufacturers during the past few weeks, and with the settlement of labor difficulties a large volume of business in this line is assured during the third quarter, if not during the entire last half, of the current year.

The Novelty Iron Works, Dubuque, Iowa, believe that thre is a decided setback in many industries on account of actual or threatened labor difficulties. Building is practically suspended in their section, many projects having been abandoned after work had actually begun. Prospects for foreign trade, they say, are about as good as usual, with perhaps the exception of South Africa and Australia, where orders are somewhat less in number than they were at this time last year.

The Stover Mfg. Company, Freeport, Ill., say that they are having a fairly good trade in the hardware line, but not so good in their line of implements. They report that the labor situation is causing them much annoyance, as there seems to be no limit to the demands made upon them, and they cannot but feel that matters must shortly come to a standstill, as everything seems to be at very high tension. They have been obliged to advance prices in order to accommodate the increased cost of production, due to advance in labor and material, until it has affected the sale of their goods. They have purposely kept down the price of their goods as low as possible, even at a loss of the usual margin of profit, to prevent if possible the stopping of their business. They believe that the limit has been reached and that the trade are hesitating about purchasing until a reaction sets in.

Tools and Supplies.

The Whiting Foundry Equipment Company, Harvey, Ill., say that so far labor difficulties have not interfered with their business. The volume of work is considerably in excess of what it was a year ago. Inquiries are quite numerous and actual orders up to date are exceedingly satisfactory, but there is an undoubted reaction in purchasing, as prices for a great deal of material are dropping. Orders are not thrown at the manufacturer as they were a short time ago, regardless of whether they could be gotten out or not. They have a good supply of business booked which will keep them employed for some little time.

Joseph T. Ryerson & Son, Chicago, state that April was an excellent month in all lines of machinery, but during the current month the orders have not been as great in number or diversity, although among them has been the most interesting order for heavy hydraulic equipment ever handled by this house. They are very hopeful that the quiet conditions of May are due entirely to existing and pending labor troubles, and that affairs will soon be normal again.

The Chicago Pneumatic Tool Company, Chicago, state that the consumers of their product, instead of being restricted to one or two industries, are constantly increasing and the field broadening, the modern pneumatic labor saving machinery superseding to a greater extent each day the old hand methods. Business prospects are very bright, the amount of business booked thus far by them in the month of May exceeding the total of both April and May last year, and every indication points to a continuation of flourishing business despite labor troubles.

The Chicago House Wrecking Company, Chicago, say that they are busier now than they have been for any time for the past year and a half. It may be possible that this is due to a more economical tendency of the trade, throwing more business to rebuilt machinery. It is a fact that during prosperous times manufacturers are not so much given to studying the question of cost in the purchase of their equipment, but when conditions alter, and with increased cost of labor, it becomes necessary to cut down every other possible expense. They have plenty of orders to keep them busy for some time and believe that it is only a question of time when increased cost of production will be counterbalanced by the increased selling prices.

The Scully Steel & Iron Company, Chicago, have experienced a fair volume of business resulting from the increased energy that they have recently put into this branch of the business. But the month of May has not been productive of results in proportion to the time and labor expended, the difficulty of securing orders for tools and other machinery being attributed to labor strikes, present and prospective. Manufacturers represented by these agents, however, on small tools are four to six weeks behind in the filling of contracts and on larger tools about two months in arrears; so that new business is not especially needed. There is consid-

erable business under negotiation, however, depending upon settlement of labor difficulties, there being considerable call for tools from the South, the West and the North. While most of the business booked during May has been for renewals, there are a number of new plants which are figuring upon purchasing full shop outfits, especially in the West. Railroads, electric plants and general manufacturers have been among recent buyers, and within the past week some shipments of magnitude have been made to the Baltimore and Pittsburgh districts and to Canada.

Power Transmission Machinery.

The Stephens-Adamson Mfg. Company, Aurora, Ill., say that they have as yet experienced no trouble with labor, and indications are that they will not do so. The company report that they have twice as much business on their books now as they had at this time last year, the largest of the contracts being satisfactorily distributed as to time of delivery, ranging from 30 days to five months. Their capacity has been greatly increased during the last 60 days by the installation of additional machinery and they never before were in such good shape to take care of customers. Their trade is constantly increasing and they report that indications are for an extremely busy year.

Pawling & Harnischfeger, crane and hoist builders, Milwaukee, Wis., state that their booking of orders is satisfactory. During April there was a decided hesitancy on the part of buyers, who apprehended more than the usual labor trouble to occur around May 1. As these labor troubles, except in certain localities, have adjusted themselves the business situation appears healthy, as judged by buying and settlements. With regard to labor matters this firm believe that Milwaukee is freer from difficulties between employers and employees than any manufacturing city of note in the United States. The many new and modern shops planned by railroads have resulted in a large volume of estimates for crane equipment; many of these contracts will be closed within 30 days. The steel and iron plants still continue the heaviest buyers, though the demand for cranes is broadening. The market is about the same as during May, 1902, though it does not reach the proportions prevailing last September. The old Nordberg shops, leased and equipped by Pawling & Harnischfeger, to replace their erecting shop burned April 15, have placed them in as good shape to build cranes as prevailed before the fire. Prominent among the orders booked since their last report are the following: American Stone Company, Brooklyn, N. Y., two cranes; Milwaukee Bridge Company, Milwaukee; Louisville Railway Company, Louisville, Ky.; Louisiana Purchase Exposition, St. Louis; Ingersoll-Sergeant Drill Company, Easton, Pa., two cranes; Milton Mfg. Company, Milton, Pa.; Vilter Mfg. Company, Milwaukee; American Road Machine Company, Kennett Square, Pa.; Stillwell-Bierce & Smith-Vaile Company, Dayton, Ohio, two cranes; Mahoning Foundry & Machine Company, Youngstown, Ohio; New York Shipbuilding Company, Camden, N. J.; McConway & Torley Company, Pittsburgh; Sterritt-Thomas Foundry Company, Pittsburgh; Standard Oil Company of New York, Atlas Works, Buffalo; Pennsylvania Engineering Works, New Castle, Pa.; Metropolitan Street Railway Company, Kansas City, two cranes; Jefferson & Clearfield Coal & Iron Company, Ernest, Pa.; International Harvester Company, Hamilton, Ont.; Gould Coupler Company, Depew, N. Y., three cranes; Helena Light & Traction Company, Helena, Mont.; American Sheet Steel Company, Pittsburgh, two cranes (1 special); Allis-Chalmers Company, Milwaukee, two cranes; Howard Iron Works, Buffalo; American Bridge Company, Ambridge Works, Economy, Pa.; La Belle Iron Works, Steubenville, Ohio; Bradley Mfg. Company, Pittsburgh; New York Edison Company, New York.

The Ætna Foundry & Machine Company, Springfield, Ill., say that strikes and other labor difficulties have a tendency to make the present outlook for business very discouraging, both in the way of delaying contracts already made and interfering with the closing of others in view. They say that higher wages will certainly add to the cost of the manufactured product and if not figured on in making contracts will be apt to reduce the profits. The demand for their product is still very active, owing to the continued development of the coal fields. They have business enough booked to last them for several months, and were it not for the unsettled state of labor, think they could book orders enough to last for the remainder of the year. As it is, however, prospective customers will sooner or later doubtless become discouraged with the outlook and await a more favorable time. They are at present building an addition to their machine shop, in spite of the fact that it will cost much more than it would have done a few months ago. Owing to restricted space and unsettled conditions the company have not pushed the sale of their product for the past month, so that the volume of business is about the same as a year ago; but with facilities increased they hope to materially increase their output after July 1. With labor difficulties satisfactorily adjusted the company believe that the last half should be the banner period of the year.

The industrial Works, Bay City, Mich., report that business continues very satisfactory with them, and their full capacity is engaged for several months ahead.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 1, 1903.

Trade conditions in the Philadelphia machinery market have developed somewhat irregular features. There was a good volume of business carried over from April, but demand dropped off before the middle of the month and conditions today are about as follows: The large manufacturers as a rule have the capacity of their plants taxed to supply the demand and in some cases are covered for the year, and have booked some orders for 1904 delivery. The medium sized plants have from three to four months' business ahead, with a fair booking of new orders, while the smaller plants are feeling the effect of the slackening of immediate placement of orders. There are, of course, exceptions, and while no anxiety as to a continuation of a good amount of business is apparent, conservative managers are not entering into new propositions without careful consideration. In the opinion of some the beginning of the end of the prosperous machinery times is in sight. A number of reasons for the tightening of purse strings of the apparent purchaser have been given, the most general, however, being the antagonistic position taken by the labor element in the various trades. The local machinery manufacturers have not been troubled to any extent by their own employees, except those who are operating foundries in connection with their plants, and in such cases molders appear to be dissatisfied with their condition.

The existing strikes in other trades affect the general placement of new business and also hold up in many cases deliveries on completed tools and appliances. The principal trouble from this source, however, lies in the deferment of improvements, extensions, &c., to many plants owing to excessive high cost and the uncertainty of the completion of work under existing circumstances.

Inquiries continue to be in good volume, but there is no immediate placing of orders except in cases of necessity. Quotations appear to be laid away for later reference, and when the time for placing of orders arrives it is quite probable that the inquiries will be duplicated. There is an exception to this condition in cases of large special machine tools, engines, &c., where orders are being placed for future deliveries.

Deliveries on castings, both iron and steel, continue unsatisfactory. Manufacturers of these lines are now obtaining supplies of pig iron, coke, &c., with regularity and promptness, and while railroads are able to furnish prompt transportation, this is more than offset by the irregular working of plants due to labor difficulties with molders and other employees. A number of local and nearby plants have been temporarily idle at times, and delays in deliveries of castings are therefore unavoidable but annoying to the consumer.

Foreign demand remains unchanged, no improvement being noted during the past month. Some manufacturers with established export trade report a falling off in orders, while with others trade is about normal.

The demand for medium, standard and special machine tools has been good, manufacturers in these lines being generally able to make fairly prompt deliveries. Dealers report a nice business during the month and machinery floors keep well stocked.

Inquiry for the smaller engines, machinery and tools has been good and a satisfactory business has been done, with deliveries varying. Machine shop supplies are still in good demand, with deliveries in accordance with the particular requirements.

Prices continue firm without noticeable change, there being no apparent tendency to shade quotations in order to get business.

The Atlantic Refining Company are erecting at Point Breeze a new one-story brick machine shop 63 x 146 feet and a pump house 10 x 20 x 68 feet. The total cost of these improvements is estimated at about $11,000.

W. E. Shipley, representing the Lodge & Shipley Machine Tool Company, has done a satisfactory business during the past month, the demand being principally for shapers and planers, several of which have been delivered to local parties. A number of orders for Reeves' variable speed pul-

ley is also to be noted, and shipments of these pulleys have been made to several local and to nearby parties.

I. H. Johnson, Jr., & Co., Incorporated, continue busy, the demand for their various types of lathes has been large and some exceptionally good business is in sight. A number of medium sized tools have recently been delivered to various local and nearby parties, while a 54-inch swing lathe with a 33-foot bed has been shipped to the Braddock Machinery & Mfg. Company, Braddock, Pa.

The Espen-Lucas Machine Works, builders of cold saw cutting off machines and machine tools, report business good, particularly for I-beam and steel foundry saws. There is also good inquiry for their other lines of machine tools. A number of large I-beam saws have been shipped during the month, as has also a special crank shaft cutting off saw.

The Hess Machine Works, manufacturers of file making machinery, note an increased demand for their machines, particularly from foreign sources. Among recent export shipments made by them were two sets of file making machines for delivery in England, one set for delivery in Russia and one set for shipment to Japan.

H. B. Underwood & Co. have recently shipped two special boring bars and a slide valve engine to the Southern Cotton Oil Company, Columbia, Ga.; rotary planing machines have been delivered to the Renova, Pavonia and the West Philadelphia shops of the Pennsylvania Railroad Company, and boring bars have been shipped to the shops of the Delaware & Hudson Railroad; Illinois Central Railroad; Buffalo, Rochester & Pittsburgh Railroad, and the Baltimore & Ohio Railroad. A 15-inch portable crank pin turning machine has also been shipped to the American Steel & Wire Company, Cleveland, Ohio. Underwood & Co. keep busy in all departments, a large amount of work is on hand, and conditions for future business are satisfactory.

The Falkenau-Sinclair Company have had a large amount of special work during the past month. Inquiries have been irregular, but on the whole in good number, and some nice business has been taken. The demand for standard presses keeps up well and a number of local deliveries, as well as to New York and Canada, have been made. A heavy rack press has been delivered to the Frankford, Philadelphia, Arsenal, for the United States Government, and a number of special governors have been shipped to the Niagara Falls Power Company, Niagara Falls, N. Y.

Dienelt & Eisenhardt continue busy in all departments. Their foundry is crowded with work, while the machine shop is busy on a number of large orders. Trade in dead stroke hammers and hydraulic jacks is good and a number have been shipped. Some large oil cloth printing machines are also in course of erection for nearby parties.

The Diamond Drill & Machine Company, Birdsboro, Pa., continue busy on a large amount of general work. Preparations to increase the melting capacity in their new steel casting department are being made, and they expect on completion, which will be in the course of the next few months, that they will be able to more than double the present capacity of that department.

The Philadelphia Roll & Machinery Company made during the past month the largest tonnage of chilled and sand rolls in the history of the plant. They are now building a new 15-ton air furnace, which they expect to have completed in a short time, and this will when finished give them even greater tonnage facilities. Inquiries and orders continue satisfactory and all departments are kept busy. Recent deliveries include both sand and chilled rolls for many of teh Eastern mills; two large roll tables for a 20-inch train have also been completed for the Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa.

The Philadelphia Pneumatic Tool Company report a great increase in their sales for May over any previous month this year. Large orders have been received for both foreign and domestic shipment, and many new customers have been added to the Philadelphia Company's list. The demand for the Keller rotary drills and riveting hammers is particularly noticeable, sales having been made to the following: Tennessee Coal, Iron & Railway Company, Great Northern Railway Company, Lake Erie & Western Railroad, Lake Shore & Michigan Southern Railway, Illinois Steel Company, Cambria Steel Company, Lorain Steel Company, Baldwin Locomotive Works, American Car & Foundry Company, American Bridge Company, International Harvester Company, Kilbourne & Jacobs Mfg. Company, the Bucyrus Company, C. & G. Cooper Company, Camden Iron Works, Detroit Shipbuilding Company, New York Navy Yard and Mare Island Navy Yard. Foreign shipments have also been made to London, Paris, Brussels, Berlin, Copenhagen, Milan, Buenos Aires and Brisbane.

The American Pulley Company report the continuation of a good volume of new business; the local and nearby demand has increased, while foreign requirements have fallen off. The South, Middle West and Pacific Coast continue sending in good orders, and shipments of carload lots of pulleys to various points in those territories have been made. Some small shipments have also been made for export, while deliveries for the city and neighboring points have been large.

The Link-Belt Engineering Company are very busy. Inquiries are numerous, the estimating department being taxed to meet requirements, and some nice business is in prospect. General orders are said to be very satisfactory and some large contracts have been taken. A retail coal pocket of 1000 tons capacity is to be erected for the Tattersall Company, Trenton, N. J., and the cement plant of the Penn-Allen Cement Company, Bath, Pa., is to be equipped with a complete elevating and handling plant.

The Alfred Box Company, builders of electric cranes, hoists, &c., continue busy. The demand for electric cranes is active and some good orders have been taken, including among others two 15-ton hand power traveling cranes for the North Third avenue power station of the Interurban Street Railway Company, New York City; a 20-ton hand power traveling crane for the Thirty-third and Market street power station for the Philadelphia Rapid Transit Company; a 20-ton of the same type for the Weehawken, N. J., station of the New York Central & Hudson River Railroad, and a 5-ton, 3-motor electric traveling crane for the rail yards of the Sutherland avenue station of the Philadelphia Rapid Transit Company. Cranes have been completed for Henry Hitner & Sons' new plant in this city, as has also a 6-ton electric jib crane for the League Island Navy Yard for the United States Government. Six 2-ton, 3-motor electric traveling cranes have been shipped the General Electric Company, Lynn, Mass., and nine 7-ton, 3-motor electric traveling cranes have been shipped the same company for the Schenectady, N. Y., plant.

The Eynon-Evans Mfg. Company have about completed improvements, previously noted, and are now beginning to install the necessary machinery. Inquiries continue numerous and a number of nice orders have been taken. The pattern department is busy on a number of large patterns for various concerns. In their foundry, besides a large amount of general work, a number of acid resisting bronze castings are being made. Steam jet blowers are being shipped to many of the large steel plants, while deliveries of general work are being made to local and out of town parties.

The Tabor Mfg. Company have completed arrangements with the Draper Moulding Machine Company, Hopedale, Mass., whereby all the patterns, patents, designs, &c., of the latter company have been transferred to the Tabor Company, who will manufacture an extensive line of these machines under the name of the Draper-Tabor hand ramming molding machine. Many additional features will be gained by this consolidation, an important one being the exclusive rights these machines will have in the Tabor vibrator arrangement, whereby stripping plates can be avoided if so desired Business conditions with the Tabor Company continue active, a number of good orders have been taken, and deliveries of molding machines have been made to both local and out of town parties.

The Barr Pumping Engine Company have closed, among others, the following contracts during the past month: A 6,000,000-gallon vertical triple expansion fly wheel pumping engine for the city of Brockton, Mass.; a 25,000,000-gallon engine of the same type for the city of Kansas City, Mo.; a 2,000,000-gallon horizontal compound condensing, direct acting pumping engine for the town of Plymouth, Mass., and a 6,000,000-gallon vertical cross compound pumping engine, to replace one of the horizontal fly wheel type, for the town of Newton, Mass. All departments of the Barr Pumping Engine Company are busy and conditions are favorable for continued activity.

The Energy Elevator Company continue to book a number of orders for elevators, the demand for heavy freight lifts being the most active. Inquiries from distant points are numerous and the local requirements are heavy. Out of town deliveries during the month include shipments of freight lifts to Elizabethtown, Pa.; Waynesville, N. C.; Newman, Ill.; Walton, N. Y.; Scranton, Pa.; St. Louis, Mo.; Lincoln, Neb.; Ocean City, N. J.; Sparta, Tenn., and other points. A large freight elevator has also been installed for the Coatesville Gas Company, Coatesville, Pa.

The plant of the Baldwin Locomotive Works continues most active. All departments are being operated at record capacities and it is expected that the output of locomotives will be far greater than any previous year. Over 15,000 employees are now on the rolls of the local plant, while the Burnham shops of the company employ fully 3,000 more. Inquiries are said to be good, and orders for locomotives are being regularly taken, a number of which are 1904 delivery. Shipments of engines of various types on order are constantly being made and include, among others, deliveries to the Philadelphia & Reading Railroad, Pennsylvania Railroad Company, Southern Pacific Railroad and other large railroad and individual companies.

A number of machinists at Wheeling, W. Va., have gone on strike, demanding an eight-hour day with the same wages as were formerly paid for nine hours. All the large shops are more or less crippled, but a number of concerns, anticipating this action on the part of their employees, have installed nonunion men in the places of those who have gone out.

HARDWARE.

IT is an interesting fact and may prove an event of far reaching consequences that while the commercial use of electricity has been necessarily accompanied by an enormous use of Wire late developments seem to indicate at least the possibility of a complete change in this regard. Should the experiments in wireless telegraphy prove successful and feasible in a commercial sense, it might be found that the demand for Wire products would be to that extent cut off, unless there should ensue one of those compensatory demands in other directions so familiar in these days of sweeping economic changes and developments. There is, however, little reason to apprehend that Wire will for a long time lose its prominence in the market, as the tendency is still toward its increasing employment as a substitute for other materials and for many new uses and purposes.

The increased celerity and economy of communication which is characteristic of methods in these days finds new illustrations in connection with the Marconi system, which may add to the facilities for the dispatch of business, and at the same time to the pressure under which those who are in positions of responsibility are working. It certainly brings up the question as to the extent to which human nature will be able to adapt itself to the demands made upon it by modern business life. It is not the question of the need of better methods of communication, for these, notwithstanding the improvements which will undoubtedly be made in them, seem in general to be sufficient to meet all reasonable requirements. The telegraph and the telephone already make such calls upon business men that the real question is as to how they can healthfully accustom themselves to the rapid pace at which they are going, so that it may not be necessary on account of the overtaxing of physical endurance to call a halt and take a slower gait. The natural plan and one that experience indicates is that of adapting themselves to environment, and already relief is more and more being sought in the distractions of travel and of social life and in outdoor recreations. This gives the vacation season now near at hand a special significance and import.

In the present somewhat unsettled condition of the labor market, with the possibility of interference with the regular production of goods on account of labor difficulties, it is desirable that the margin of profit realized by manufacturers should be such as to permit them to make some concession to the demands of labor for increased remuneration in case the matter suddenly come to an acute issue. In this way strikes or serious misunderstandings, which are disadvantageous to both parties, may sometimes be averted for the time at least, and reasonable requests of workingmen for advances be granted without disturbance of prevailing prices. A manufacturer in prosperous times like the present is entitled to a margin of profit which will permit him to give to his employees some benefit of the existing conditions. It is not well in this state of things to keep the selling price too near the cost line.

Condition of Trade.

The amount of business which was transacted by the merchants throughout the country during May was of such volume as to give no cause for complaint. The retail merchants are unquestionably busy, with a steady and healthful demand upon their stocks which indicates a good condition of things among the people at large. Wholesale houses are naturally reaping the benefit of this state of things, and there is on the whole a free movement of merchandise, which is taken care of in a very satisfactory way by the stocks of goods accumulated to meet the calls of their retail customers. Manufacturers are also getting some business as a result of this condition of things, but for the most part jobbers' purchases early in the season have covered their requirements and their stocks on the general run of goods are holding out. More or less trouble is experienced on account of manufacturers being behind their orders on certain lines, and during the past month or two there has been a good deal of correspondence in regard to hurrying shipments, explaining delays, &c., and at this comparatively late stage of the season this has not yet altogether ceased. On the whole, however, there is less difficulty in getting such lines. The interference with business on account of strikes and labor difficulties is one of the unpleasant features of the situation. While there are many parts of the country in which no trouble is experienced, the extent of the interruption to enterprise in many towns and cities is serious and has an influence that is felt outside of the territory immediately affected. The floods which are prevalent in the West, with their attendant loss of life and property, call out sincere sympathy from the entire country, and are also recognized as having an injurious effect on the general business situation, especially on account of the damage to crops in some important sections. The prevalence of dry weather in other parts of the country, although for the most part now relieved by rains, is also an influence which militates in a certain degree against the business prosperity of the section immediately concerned and to some slight extent involves a diminished volume of trade in that territory. All parties are watching the course of the market in the raw material with some solicitude as, notwithstanding the reasonableness of lower prices and the desirability, all things considered, that a more normal level be reached, there is a certain amount of apprehension connected with any weakening in values. Fears are naturally suggested that the reduction in price may go too far and may be attended by a discouraging of enterprise and thus a limiting of the demand. In Hardware products generally there is little change, and the market on the whole has a steady tone. The financial condition of manufacturers and merchants is regarded as exceptionally sound.

Chicago.

(By Telegraph.)

The fact that the freight handlers' strike has been averted and that other labor difficulties have assumed a more favorable aspect has given birth to a more confident and firmer feeling in Hardware circles. But the discouraging element has been the floods in the Missouri Valley, which have driven a number of salesmen home from that territory, it being next to impossible to draw business for the moment. Eventually, however, the catastrophies will result in a larger volume of business. It is significant that, notwithstanding the drawbacks during the month of May, manufacturers of staple articles report the volume of the tonnage placed somewhat in excess of 1902. Jobbers, possibly, have suffered more than manufacturers, but even so, the returns have not been as unsatisfactory as might have been expected from daily reports. The new tonnage being placed for Wire and Nails continues to show a falling off, but specifications on commitments have been more satisfactory. There has been more business in heavy lines of Hardware, a feature of interest being the placing of contracts by Implement manufacturers for the season's requirements of Bolts, Nuts, Rivets and Screws. The general trade in Bolts and Nuts, however, has been quiet, but Boiler and

Structural Rivets have sold well, and Stove manufacturers have bought more freely of Bolts. Sales of Screws to general manufacturers, too, have increased quite considerably, and it is notable that manufacturers' prices are well sustained; jobbers are still cutting prices on old stocks, but even this is being indulged in to a less extent than usual. Washers have continued scarce, the most important manufacturers in this section being unable to take new orders for delivery inside of two months. Tapped Nuts are also in light supply. There has been a fair demand for Spikes, and more satisfactory orders received for Chain, but there is more competition in the latter and prices are irregular. There has been a fair movement in Galvanized Iron Cans, but the market is somewhat unsettled as far as prices are concerned. Three or four fair sized orders for Builders' Hardware have been received from the country and placed with manufacturers during the week. The contract for the Railway Exchange Building, which has excited considerable interest, has been placed with a retail dealer, and will be given to a manufacturer within the next day or two. Contracts for the Traction Building at Indianapolis and the Victoria Building at Chicago are expected to be placed soon. The small city trade has not improved essentially during the week. There has been a fair demand for Tools and Shelf Hardware, with a prospect for a considerable increase in the next few weeks in this line. Boxwood Rules are scarce and wanted. A number of fall orders have been taken recently for Axes, Scoops, Hods, &c., and shipments will be made in June and July. There has been only a moderate demand for the summer lines of goods which have been referred to frequently, the cold, wet weather interfering with the sale of such articles. The scarcity in many lines of goods referred to in the report a week ago has not yet been relieved to any appreciable extent, and this condition seems likely to prevail for several weeks if not longer. An amusing error made by the telegraph company last week resulted in the quoting of Sheet Zinc at 80 cents, instead of 8 cents, Chicago. There is a great scarcity of this article at the moment due to strikes and fires at some of the mills. It is interesting to note that returns for May show that the entire capacity of the mills of the American Steel & Wire Company prior to the acquirement of the Union and Sharon mills has not only been disposed of, but a fair proportion of the tonnage of the Union and Sharon mills has been contracted for, showing an increased consumption of these products.

St. Louis.

(By Telegraph.)

There seems to be little complaint in the matter of the falling off in the demand for Hardware supplies, but the movement of goods from the jobbers' warehouses has been fraught with great difficulty and delay for some days owing to a continuance of the series of strikes. There has been more or less of a congestion of shipments, but as differences seem now to have been satisfactorily arranged jobbers have about caught up, and it is expected all will move along smoothly from now on. The conditions pointing toward a lower range of prices of iron and steel products are showing to some degree in certain lines of manufactured Hardware, although no material changes in prices have been made as yet. Manufacturers of Wire Screen Cloth continue to feel a pressure of business in certain grades of their product, and it has been extremely difficult at times to keep pace with the demand. The news of the past few days telling of the severe losses occasioned by the floods in the West is a factor that will likely have to be reckoned with when the full extent of the damage is known. No doubt the railroads have been severely crippled and much complaint and inconvenience will be occasioned by delay in receiving shipments. Many lines of goods continue scarce and jobbers are having considerable difficulty to satisfy fully the demands of the trade, especially for Axes, Saws, Hammers, &c. Specialties for summer, such as Refrigerators, Freezers, Lawn Mowers, &c., are moving just about as fast as jobbers can secure them from the manufacturers. In the heavy department of the market the unsettled condition of prices for iron and steel products has had a considerable effect on trade, although the movement of general heavy lines is said to be of a fair order.

Philadelphia.

Supplee Hardware Company.—Trade continues without any marked change in the situation since our last letter, although there are two views of the present situation which look like two great search lights placing the facts before one.

The Pennsylvania Railroad Company are now making vast and wonderful improvements, not only in additional rails, but in many cases substituting new and heavier rails in place of others, besides enlarged facilities between this city via Pittsburgh to points reaching Chicago and St. Louis. These changes and improvements require a largely increased force on their lines and have naturally stimulated trade in many of the towns through which the road passes. The projected tunnel of the Pennsylvania Railroad under the river to New York has stirred up the New York Central, who are also making important changes. Nor does the illustration end there, as Southern roads are making arrangements for extensive alterations and extensions. It is, therefore, no wonder that there is a present scarcity of raw material and heavy goods incidental to these requirements.

The other search light shows as follows: Dissatisfaction in the minds of many employees in manufacturing establishments has not alone existed with the coal miners, and their partially satisfactory settlement made thousands and thousands of others feel they also had grievances, and therefore thousands and thousands of men have been voluntarily out of employment. In our own city it is supposed that nearly 100,000 persons left the factories on June 1. Outside of these, carpenters, builders and others have quit work, placing improvements at a standstill. In some cases the demand is for shorter hours only with the same pay, in other cases additional remuneration without any shortening of hours. In some cases both are demanded, until it reaches a point where the accumulation of bank accounts in the possession of the average workmen must naturally be diminished; and were it not for the wonderful prosperity that has settled upon our country the last few years if the same system was pursued it would cause poverty and distress. The prosperity of our country will keep the mills employed, but those manufacturers who make for export are uneasy, fearing ultimate results and a large loss of export trade, which, once lost, will require a scramble to regain. This latter illustrates the view taken of it by those persons who are expending millions and millions of money. In the meantime those engaged in trade, as well as the masses, must await results.

Louisville.

W. B. Belknap & Co.—The market for finished material seems steady, though it is hard to dissociate the alternate panic and boom elements of Wall Street from our business calculations. It is an old time saying that iron is the barometer of general conditions, and all sorts of people used to dive into our office to have a look at our private glass. (Understand, of course, that this "glass" is the strictly nautical variety.) But nowadays we are given to understand that a new order of things is abroad, and that the great company, whose wings stretch from the Mesaba ore beds on the west to Sparrow's Point on the East, will take such a kindly interest in the market that it shall not be subject to old time variations, no matter what the mteorological conditions are abroad. They undoubtedly can do a great deal toward accelerating or retarding certain movements, but we doubt if anything other than omnipotence itself can regulate the natural order of things as determined by supply and demand. We do not believe there is any string strong enough to keep the oscillating pendulum upon one side of perpendicular so that it could never descend. Of course there are lots of people who would believe almost anything, who have had to confess their mistakes on the date set for a second advent and startling events of like nature. Just how far credulity can be worked on is a nice point in itself, and the Wall Street market helps us to an opinion from time to time.

The extreme drought in this part of the country has

sent prices of country produce skyward. Within the last few days this drought has been modified by showers, but still we are very deficient in rainfall, and as the season was late anyhow predictions as to crops are next to impossible. One undeniable proposition is, however, that if we have good crops we shall have good business.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—We are having a cold backward spring in the Pacific Northwest that certainly has done, and is doing, an injury to growing crops. Should the weather, however, turn warm and more rain fall in some sections a part of the damage will be overcome.

Sheep men are disappointed in opening prices for wool, they being much under what was expected. While strikes have not been officially called off many more mechanics are at work than a month ago.

The American Can Company are putting up a large building on our water front, 300 x 400 feet, intending to concentrate their business in Oregon and Washington at Portland. This will add a large number to our manufacturing pay roll.

Freights, both to Orient and Europe, are tumbling. A rate of $1 per ton for flour by steamer from Pacific Coast to China was put into effect last week, owing to competition, and now sail rates are down to Europe, on account of failure of wheat crop in California, which promised so well in early spring that too many ships headed this way.

An interesting ocean race between an English and a French ship ended last week. Both sailed from Columbia River the same day, and each arrived at English port same day, sailing 14,000 miles in 124 days.

Trade continues in strong volume, notwithstanding drawbacks that we have to contend with. Collections are not as good as earlier in the season.

Baltimore.

CARLIN & FULTON.—The month of May has shown a normal state of business, interfered with somewhat by the severe drought which prevailed throughout this section most of the month, but refreshing rains have now helped the growing crops and the agricultural community feels encouraged.

Building operations in this section have not been as severely affected by strikes as in other communities, there having been shown a spirit of compromise between employer and employee.

June and July being generally quiet months, between seasons, stocks of goods are kept to the minimum, and with the exception of the demoralization in the Axe market, prices seem generally well sustained.

Our Southern friends would be very glad to see the present abnormal prices of cotton hold good for the growing crop, but of course it is not to be expected, though undoubtedly the new crop will bring to the planter a more satisfactory price than for a long while, which will result in good trade from that section.

San Francisco.

PACIFIC HARDWARE & STEEL COMPANY.—Business still continues to increase—in fact, many departments in our store have latterly been taxed to their utmost capacity. In the Hardware line, at any rate, we are all doing a great deal more business than has been done in this city at any time in the past. It is easy to understand that with this large increase in volume it has been difficult to keep stocks in shape. This is true not only on account of the increase in business but particularly on account of the very slow deliveries made by many factories. We have always claimed on account of our long distance from factories and the length of time our shipments are required to be in transit that we should be entitled to every consideration from the manufacturer, and given as prompt shipments as his facilities can bring about. We believe that many factories realize the justice of this contention and that the Pacific Coast houses are given very prompt shipments.

Notwithstanding this, and the necessity of extremely large stocks that are carried by local jobbers, the shortage that we find in many items is quite apparent at this time, but from recent issues of *The Iron Age* we note that the same condition exists in many jobbing centers, and from the tone of what we read there we take it that our stocks here are really in better shape than they are in other sections of the country, and that we are in fact able to give our customers more prompt shipments and more complete deliveries of orders. While we are not pleased that our stocks are not as we should like them, we are glad indeed to be able to report that the volume of business has been beyond all expectations.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The month of May was just like all the balance of the past year. It was one of the best months in the history of the hardware trade. The sales showed a large increase over those of May, 1902, and the local jobbers are more than satisfied with the condition of affairs.

The general business situation in Nashville was never better. Wholesalers and retailers in all lines of trade have done a splendid business. Collections have been extremely satisfactory, and such a thing as failure is almost unknown.

In this connection we will mention the fact that the city of Nashville's bank clearings for the past five months have shown an increase of 45 per cent. over those of last year. We understand that this is the largest increase shown by any city in the United States during this length of time.

New Orleans.

A. BALDWIN & CO.—We usually look for considerable falling off of business about this time of the year, but we are pleased to state that our business during the month of May has been far in excess of the same month for several years back. The country merchants are ordering very freely, and the general conditions are so promising that they do not hesitate in placing orders for such goods as they need.

NOTES ON PRICES.

Wire Nails.—The demand for current requirements continues fair, and mills are also making shipments on contract orders, specifications for which are being received in fair volume. The market is firm and quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$2.00
Retailers, carload lots	2.05
Retailers, less than carload lots	2.15

New York.—The continuance of strikes among the building trades is having a marked effect upon local demand. Some orders are received, however, while from nearby territory the demand is larger. Under the conditions ruling jobbers are quite well satisfied with the amount of business being received. The market is firm at the following quotations: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

Chicago, by Telegraph.—The new business which has been placed during the week has been relatively small, but larger specifications have been received on commitments, which are keeping the mills busy. It is notable, however, that a number of independent manufacturers are now able to take on considerable business and can make prompt shipments. However, there is no disposition to change quotations and prices are well sustained. Official quotations continue steady at $2.15 to $2.20 in carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For galvanizing 75 cents per keg and for tinning $1.50 extra per keg is charged.

St. Louis, by Telegraph.—The demand is more quiet for Wire Nails, although jobbers continue to handle a fair volume of business. In small lots from store the quotation is $2.35.

Pittsburgh.—The labor troubles in the building trades, both East and West, have interfered very seriously with demand for Wire Nails, which at the present time is somewhat quiet. The mills are making prompt deliveries, and there is practically no trouble in getting shipments as fast as needed. Prices are firm, but without change.

We quote as follows: $2 in carloads to jobbers, $2.05 in carloads to retailers and $2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days; for galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

Cut Nails.—At the meeting of the Cut Nail Association last week the prices for May were reaffirmed for the month of June. There was not a full attendance at the meeting, as the manufacturers were generally of the opinion that a change in prices was not advisable at this time. The market is firm and quotations are as follows: $2.15, base, in carloads and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—Conditions in the local Cut Nail market are unchanged. A steady but restricted demand characterizes the situation on account of the continued labor strikes. The market remains firm and quotations for carloads and less than carloads are as follows: Carloads on dock, $2.29; less than carloads on dock, $2.33; small lots from store, $2.40.

Chicago, by Telegraph.—There has been only a moderate volume of business for either Steel or Iron Cut Nails, and it is reported that shipments are a little unsatisfactory. However, prices have remained steady, as previously quoted. Sales continue to be made on the basis of $2.30 in carload lots and $2.35 in less than carload lots for Steel, Chicago. Iron Nails are held at $2.45 to $2.50 per keg from store.

St. Louis, by Telegraph.—Cut Nails continue in moderate demand, and jobbers quote in small lots from store Steel at $2.40 and Iron at $2.55.

Pittsburgh.—The Cut Nail Manufacturers' Association at a meeting held last week reaffirmed May prices for June shipment. The supply of Cut Nails is now about equal to demand and there is practically no trouble in getting shipments. The market is firm and prices are as follows: Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads; Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—The wants of the trade are being largely supplied from contracts placed some time since, although a limited amount of new business is being placed. The difficulty of obtaining billets is interfering somewhat with the filling of orders. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.30	$2.60
Retailers, carload lots	2.35	2.65
Retailers, less than carload lots	2.45	2.75

Chicago, by Telegraph.—The new orders have continued light but specifications on contracts have been larger, which the mills are able to take care of as steel is in more ample supply. It is interesting to note that the tonnage placed during the last month exceeded that of May, 1902. The jobbing trade has continued moderate. Galvanized Wire is selling on the basis of $2.75 to $2.80 in carload lots and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Polished, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

St. Louis, by Telegraph.—For this advanced stage of the season Barb Wire shows a very fair amount of activity. In small lots from store jobbers quoted Painted at $2.65 and Galvanized at $2.95.

Pittsburgh.—Only small lots are being placed, the heavy consumers specifying quite freely on contracts placed some time since. The tone of the market is firm, and we quote, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.30; Galvanized, $2.60, in carloads to jobbers; Painted, $2.35; Galvanized, $2.65, in carloads to retailers; Painted, $2.45; Galvanized, $2.75, in small lots to retailers.

Smooth Fence Wire.—The trade are depending almost entirely upon contract orders for supplying their requirements. While new business is light the mills have enough tonnage on their books to keep them steadily employed for some time. The market is firm at the following quotations, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95
Less than carloads	2.05

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—Independent mills, as well as those of the United States Steel Corporation, are working to full capacity on business already in hand and are possessed of sufficient contracts to continue so for some time, notwithstanding that new business has continued to fall off. The orders for Fencing are especially urgent, but shipments are being made more readily than heretofore. The market has continued firm, the following prices being current: Nos. 6 to 9 sell at $2.05 to $2.10 in carload lots on track, and $2.15 to $2.20 in less than carload lots from store, Galvanized bringing 30 cents extra for Nos. 6 to 10 and 60 cents extra for Nos. 15 and 16.

St. Louis, by Telegraph.—The demand on the jobbing trade for Smooth Fence Wire is said to be of fair volume. Quotations in small lots from store are as follows: No. 9, $2.30 and Galvanized $2.60.

Pittsburgh.—Demand is light, but the mills are fairly busy on old contracts placed some time since. Prices are firm and are as follows: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Carriage and Wagon Springs.—There has for some time been some irregularity in the prices of Carriage and Wagon Springs as the quotations determined upon have not in all cases been maintained. As a result of this condition the market is now an open one, and current prices are represented by those of the Tuthill Spring Company, Chicago, given below. On orders for less than five pairs of a kind and size ½ cent per pound additional is charged. Terms 60 days, or 2 per cent. discount for cash in 10 days:

Carriage and Wagon Springs, tempered, regular standard sizes and shapes:

Ground Black	$4.50 per 100 pounds.
Ground Half-Bright	4.50 " "
Ground Bright	5.00 " "

Painted Seat Springs:

1½ x 2 x 26	48 cents per pair.
1½ x 2 x 28	58 " "
1½ x 3 x 28	80 " "

Tuthill Tongue Supports—⅝, $1.10; ¾, $1.40 each.

Binder Twine.—Eastern manufacturers have generally sold their output up to July 1, while others are sold even further ahead than that date. They are now busily engaged in filling orders and are accepting no new business. It is reported that the International Harvester Company have begun selling Twine again, in so far as filling second orders in territory where harvesting is the earliest, but that they are not soliciting business in other parts of the country. It is understood that they are asking no advance in prices over those announced by them April 1, which were on a 10½-cent basis for Sisal and Standard. If such is the case, and it presumably is, it would seem that this competition might enable dealers, who are not implement agents of the combined companies, to purchase Twine at the same prices, and not be obliged to pay from 1 to 2½ cents per pound advance, as some are reported to have done. If, however, the lower price is not obtainable, and necessity demands, a careful canvass of the possible requirements of their customers would aid in buying in a conservative manner, and probably prevent carrying over large quantities of Twine. The following are the prices adopted by Eastern manufacturers on April 1, which are ¼ cent less than at Chicago, owing to the difference in freight, f.o.b. Eastern mills, with ¼ cent rebate in carload lots:

Sisal	10¼c.
Standard	10¼c.
Standard Manila (550 feet)	11c.
Manila (600 feet)	11¾c.
Pure Manila (650 feet)	12¾c.

Cordage.—Rope continues in good demand at unchanged prices. Quotations are as follows, on the basis of 7-16-inch and larger: Sisal, according to quality, 9 to 10 cents; Manila, on the same basis, 12 cents per pound. A rebate of ¼ cent per pound is allowed on large lots.

Glass.—The Executive Committee, in whose hands the question of buying the 300,000 boxes of Glass at the meeting held last week was placed, have been in correspondence with members of the Jobbers' Association who were not present to ascertain how much Glass they would buy. Reports indicate that replies have not been very general. It is generally supposed that the agreement of the three combines to sell their Glass through a central agency and to guarantee prices until August 1 is a temporary one, and is only made to sustain prices through the summer months. A meeting is scheduled for this week to receive the decision arrived at by the Jobbers' Association relative to making the purchase. The American Window Glass Company are supposed to have about 1,000,000 boxes of Glass on hand, so that the allotment of 300,000 boxes is comparatively insignificant. If their blowing machine is a success they can probably control the market in the fall, but if not it is questioned how large an influence they can exert, owing to the outside capacity for making Glass. Strikes among the building trades have further reduced the already small demand, so that jobbers are doing practically nothing. The fact is not to be lost sight of that while a large amount of building was under way and projected, the largest proportion in dollars and cents was represented by large buildings, in which Plate Glass would alone be used. Thus the Window Glass situation would not be helped at all. Quotations of the Jobbers' Association, for either single or double strength, are as follows:

	Discount.
From store	90 and 10 %
F.o.b. factory, carload lots	90 and 20 and 2½ %
F.o.b. factory, 2000-box lots	90 and 25 %

Oils.—*Linseed Oil.*—The market continues dull and uninteresting. Both large and small buyers are pursuing a hand to mouth policy in purchasing. Seed has declined in price, and it seems as if nothing could be done on the part of crushers to stimulate trade until after the size of the new crop of Seed is known in the fall. It is estimated that 10,000,000 bushels of old Seed will be carried over into the new crop. City Raw is quoted at 44 cents per gallon in lots of five barrels or more, and out of town Raw at 41 cents in like quantity.

Spirits Turpentine.—The market has fallen off considerably during the week owing to a slump in prices at Savannah. This has made buyers timid, who have only been purchasing for actual requirements. Quotations, according to quantity, are as follows: Southerns, 48½ to 49 cents; machine made barrels, 49 to 49½ cents per gallon.

A WARNING TO THE TRADE.

WE are in receipt of the following letter, in which reference is made to the operations of an impostor who has lately been making the rounds of the trade:

DENVER, COL., May 28, 1903.

To the Editor: We again regret to have to announce that a certain person is traveling in the East visiting different jobbers and manufacturers representing himself to be an officer of this company, placing large orders and afterward requesting that they honor his draft on this house. We shall be obliged if you will kindly publish in a conspicuous place in your paper that should a person representing himself as an officer of this company call upon any of our friends asking accommodation of this kind they wire us before accommodating him.

Some six months ago this same dodge was worked on our good friends, and the party working the game succeeded in raising considerable money, and we dislike very much to have any of our acquaintances fleeced in this way. We also trust that other trade journals will make note of this.

Yours truly,

THE GEO. TRITCH HARDWARE COMPANY.

HARDWARE FACTORY COST METHODS.

WE give in the following extracts from letters from manufacturers some suggestions in regard to methods which are approved by them for keeping track of their manufacturing costs. We also illustrate one of the many forms of Time Cards:

KEEPING RECORD OF MANUFACTURING COSTS.

From a Massachusetts Manufacturer: It has been our custom for some time to keep the cost of each article made by us, and when same has been invoiced we have set over against the selling price our recorded cost price, which is intended to cover only the material and labor expended in making the article. These prices are revised from time to time to meet any important changes in the market for materials and labor, and while we do not consider them as absolutely correct, still we find them near enough so to answer our purpose.

Our object in obtaining these costs was not only to help us in establishing a selling price, but also to aid us in knowing each month approximately the amount of our inventory, which we obtain in this way; beginning the year with the inventory for the current year, we add to that the purchases and amount expended for labor, we deduct from this sum the amount of the sales as figured from what we call our cost prices, and this gives us a pretty good idea of our inventory at the end of each month.

For special work it is our custom to have cards prepared which go into the factory, and have each man enter his labor and material as furnished by him; when the card is returned to the office a proper entry is made of the results.

KEEPING RECORD OF MACHINE WORK.

From a New England Manufacturer: We have up to the present time been unable to find a system laid out by any of the people who furnish this work that would work to so good an advantage as the one we have been using. We know it is a rule in many of the large factories to keep the exact time and then add a fixed shop expense. We find in our class of work that with the system which we use, which consists of having a set price for each machine and man or men running same, and using this as the base, taking the actual time for each operation which the work goes through, we get a more satisfactory cost than by any other system with which we have been familiar. We have, therefore, come to the conclusion that different manufacturers must necessarily have a different system of keeping costs. This one we have found to be very satisfactory.

ALLOTMENT OF GENERAL EXPENSES.

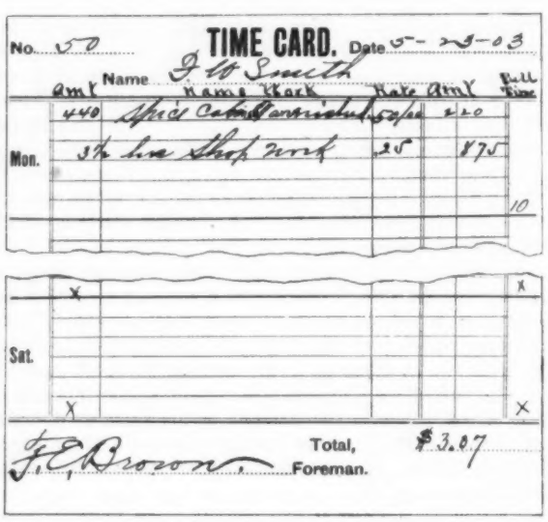
From a Pennsylvania Manufacturer: We have our business divided up into a number of different departments, and to each general item of expense charge up all material and labor belonging to that special item. For instance: Power takes fuel, water, engineer, fireman, &c. The great part of our work is by piece work, so that it is easy to determine the cost by adding the labor and materials together.

The general running expense account is somewhat more difficult to arrive at accurately. This we do by taking all items of expense, such as interest, traveling, salaries, &c., aggregating them and ascertaining what percentage that is of the labor and materials for the year or six months next preceding, and adding that percentage to the present cost of materials and labor on each item.

This, of course, is not strictly accurate, as, for instance, last year's materials, such as pig iron, &c., our largest items, have been very materially advanced, from 50 to 75 per cent. or even more in value, without a corresponding advance in other fixed charges, so that that would make the percentage plan of estimating running expenses for this year more than they really should be. This is the only way we have found to estimate with anything like accuracy that item of cost.

FORM OF TIME CARD USED BY THE ARCADE MFG. COMPANY.

The Arcade Mfg. Company, Freeport, Ill., use in their factory a time card, a reduced broken view of one of which, partially filled out, is shown in the accompanying

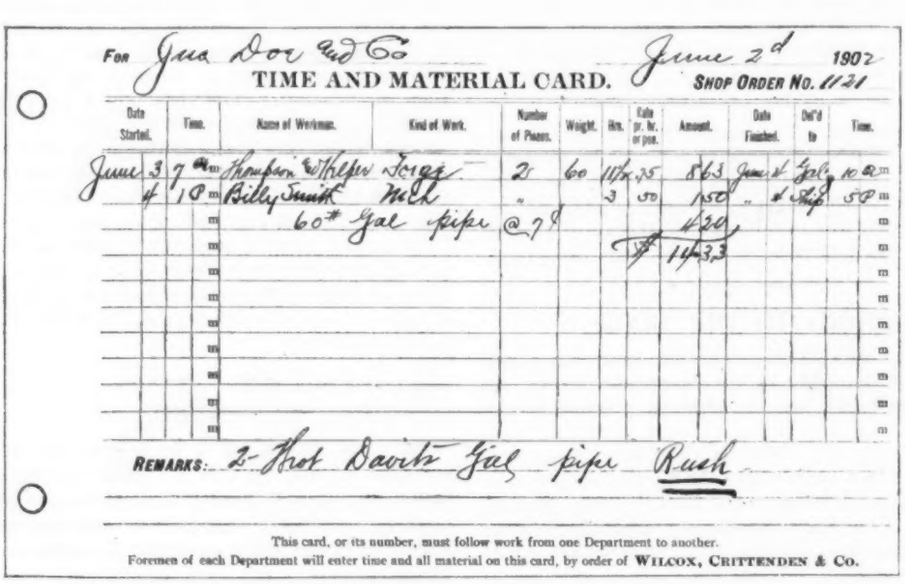


The Arcade Mfg. Company's Time Card (Actual Size 6 x 10 Inches).

illustration. At the head of the card is given the number and date of the order and the operator's name. Below it are six divisions, one for each day of the week, and in the proper places entries are made showing the amount of labor, either time or piece work, the character of the work, the rate and the amount that the labor is worth. These amounts are totaled at the end of the week, and the weekly pay roll made out from the time card, the time card first being approved by the signature of the foreman. The small crosses appearing in the Friday and Saturday space show that no work was done on these days.

WILCOX, CRITTENDEN & CO.'S TIME AND MATERIAL CARD.

In the accompanying illustration is shown the time and material card which is used by Wilcox, Crittenden & Co., Middletown, Conn., in keping track of the costs of special jobs coming to their factory. The costs on the regular articles which they manufacture are estimated by a system which is quite different from this. When special orders are received one of these cards is made out for each order, and each card follows its respective job through the different departments, so that at the time the article is ready for shipment the card shows the exact amount of time and of material which has been consumed, these entries having been made by the foremen of the several departments. From these figures the price of the finished article is calculated. It is claimed that this card saves a great deal of running around, and enables the office to be fairly sure of all of the items which should be charged against the article.


For Jno Doe and Co
June 2d 1902
TIME AND MATERIAL CARD.
SHOP ORDER No. 1121
Date Started
Time
Name of Workman
Kind of Work
Number of Pieces
Weight
Hrs.
Rate pr. hr. or pce.
Amount
Date Finished
Del'd to
Time
June 3 7 a m Thompson & Phelps Forge 2 60 11½ 25 863 June 4 Gal 10 a m
4 10 a m Billy Smith Mill 3 50 150 " " Shop 5 p m
60# Gal pipe @ 7¢ 4 30
14 33
REMARKS: 2 Hot Davits Gal pipe Rush
This card, or its number, must follow work from one Department to another.
Foremen of each Department will enter time and all material on this card, by order of WILCOX, CRITTENDEN & Co.

Wilcox, Crittenden & Co.'s Time and Material Card.

AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.

THE programme for the semiannual meeting of the American Hardware Manufacturers' Association, which takes place at Saratoga Springs, July 14-17, simultaneously with the annual convention of the Southern Hardware Jobbers' Association, has not yet been formally completed, but as mapped out at present the members as invited guests will attend the opening session of the jobbers on Tuesday morning, July 14. In the afternoon the Manufacturers' Association will have their opening session, to which all manufacturers are invited, whether members or not. At this session the president will make his official address, and reports will be heard from officers and committees. On Wednesday morning a joint session of both associations will be held, with the jobbers as guests, at which some topic not yet selected will be presented for general discussion. Thursday morning's session will be of a strictly executive character, and open only to manufacturers and their direct representatives. It is expected to have four formal addresses by well-known manufacturers, each to be followed by discussion. Friday evening the usual banquet will be given by the manufacturers to the visiting jobbers and others in attendance at the conventions.

INDIANA RETAIL HARDWARE DEALERS' ASSOCIATION.

THE Executive Committee of the Indiana Retail Hardware Dealers' Association held a meeting in Indianapolis on the 1st inst., to conclude the preliminary plans for the organization of a mutual insurance company for Hardware dealers. All the members of the committee were in attendance, including M. L. Lewis, Marion; W. P. Lewis, New Albany; Chas. Boonshot, Petersburg, and the officers of the association, E. M. Bush, president, Evansville; A. N. Shidler, first vice-president, South Bend; W. A. Shipley, second vice-president, Lafayette, and M. L. Corey, secretary, Argos. The committee decided upon the form of application blank that will be sent out to the Hardware dealers for their signature for stock and outlined a circular to accompany the application blanks, pointing out the advantages of a mutual company such as is planned. These will be printed promptly and forwarded by the secretary.

The law of Indiana requires such companies to have at least $50,000 in premium notes and $10,000 cash before they are entitled to a charter from the State. About $400,000 of stock was pledged for the proposed company at the convention this year. It will require another $400,000 of insurance before the company will be in a position to go before the Insurance Department of the State with their request for authority to do business in Indiana. The members of the Executive Committee incline to the opinion that the task of raising the additional amount will not be a hard one.

The committee also considered the matter of preparations for the next meeting of the National Association in Indianapolis. The discussion was only general in character, and no details were arranged. The members were a unit on the proposition, however, that the delegates to the convention would be so heartily received and so well cared for that they would not be sorry that they changed their meeting place from Illinois to Indiana. The members of the Indiana Association are enthusiastic over their opportunity to be hosts for their fellow dealers of other States.

There was another result of the meeting of the executive committee. The organization of employers' associations has proceeded this year as never before in Indiana. Each member of the committee learned from the other that such an organization had been formed in his home town, and there was interesting comparison of success and results. They go under such names as Civic Alliance, Merchants' and Manufacturers' Association, Business Men's Club, &c., but all, it appears, have the same basic purpose—protection from those methods of labor unions that work an injustice to employers—the boycott particularly, and next to that probably the forced closing of places of business at certain hours, irrespective of the interests of the men who own them. Every member of the executive committee had good reports to make of the effect of these employers' organizations. The unions have been able to have their way before where there was not unity of action among the employers. The situation is quite the reverse under the association plan. When the boycott has been tried in cities having the civic alliance it has proved a sort of boomerang, as one of the rules of such alliances is that when a member is boycotted by a labor union each of the members of the alliance is obligated to throw his individual trade to the one under boycott. Not a word, however, is heard against labor unions as organizations. The fight is against the arbitrary and unjust methods that the unions have so far failed to eradicate.

THE E. M. MILLER-SHAW HARDWARE COMPANY, Denver, Col., have been organized with a capital of $25,000. Their business is that of iron merchants and manufacturers' agents in Hardware and Railway and Builders' Supplies. Their office is in the Century Building, with warehouse at 1740-1742 Wyncoop street. E. M. Miller is president and manager of the company; S. G. Shaw, vice-president and treasurer, and G. W. Gano, secretary. While the company carry some stock on hand which they sell for their own account, they only buy and sell such goods as are made by the various manufacturers represented by them, and are in the strict sense of the word manufacturers' agents. In most cases the goods sold by them are billed direct by the manufacturer to the parties to whom they sell, and goods are carried in stock simply for the purpose of filling orders for their regular customers when they want goods quickly and cannot wait to have them shipped from factory.

HARDWARE CONSOLIDATIONS.

DURING the past week a good deal has been said in the daily press concerning a projected consolidation of the interests of the various manufacturers of Hardware in New Britain, Conn. There is not, however, we are officially advised, any foundation for these reports, and nothing of this sort is in progress or contemplated.

The trade will recall the organization under the laws of Connecticut of the United States Hardware & Metal Corporation, representative largely of the interests of the Bindley Hardware Company of Pittsburgh. It is now reported that under date of June 1 the corporation have filed a certificate of increase in stock from $1,000,000 to $1,651,000. Of the additional capital, it is stated, $33,200 have been paid in in cash, and $588,300 in property, the property consisting of 5338 shares of the capital stock of the McIntosh Hardware Corporation and 495 shares of the capital stock of the Bartlett Furnace & Range Corporation, the latter corporation having recently been organized with the following officers, most of whom are identified with the Bindley Hardware Company: President, W. H. Cochrane of Pittsburgh, Pa.; vice-president, J. C. Bartlett of Pittsburgh, Pa.; secretary, E. J. Lloyd of Edgewood Park, Pa.; and treasurer, J. Reitz, Jr., of Pittsburgh, Pa. The capital stock is said to be $100,000.

The parties concerned in these business changes are reticent in regard to the details of the transactions or the character and scope of the enterprise.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM NINNEMANN HARDWARE COMPANY, who have succeeded Fletcher Hardware Company in the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Paints and Oils, Sporting Goods, &c., Lewiston, Idaho.

FROM MELVIN TILLEY HARDWARE COMPANY, Wellston, Ohio, who are successors to E. E. Donaldson in the Hardware and Agricultural Implement business.

FROM FRIES, BEALL & Co., who have just opened a store at 522 Tenth street, N. W., Washington, D. C., carrying a complete line of repairs for all Stoves and Furnaces in their section. They will also do a jobbing business in Stoves, Furnaces, Gutter, Spout, Solder and Sheet Metals.

SIMMONS' STRIKE AT AN END.

The striking porters and packers of the Simmons Hardware Company, St. Louis, have arranged their differences and have returned to work. The company are now in a position to handle in a prompt and careful manner all requirements of their trade.

Hathaway Bros., wholesale Vehicles and Implements, Sioux City, Iowa, have dissolved partnership, C. E. Hathaway retiring to engage in business in the same line at Council Bluffs, Iowa. W. S. Hathaway will continue the business as heretofore at Sioux City.

E. Foerster, secretary of the Wm. Frankfurth Hardware Company, Milwaukee, accompanied by his wife, will sail from New York in November on a European trip.

THE TRAVELING SALESMAN HIS METHODS AND CONTROL

BY SAMUEL MASTERS.

CHAPTER XX.—SALESMEN'S ANNUAL CONVENTIONS.

THERE is one practice which prevails among jobbers, the value of which can hardly be overestimated, and that is the annual convention of salesmen, when all the men are in for a week or ten days, and a thorough canvass is made of the line and the trade situation. Twice a day sessions are held, continuing until the ground is thoroughly covered, the weak points in the line noted, and the policy for the coming year outlined.

The Assembly Room.

The writer can perhaps best tell of this work by describing the method employed by a large Western house. In this establishment the salesmen's convention lasts one week. The men are enjoined to be on hand early Monday morning, and by 10 o'clock of that day the first session is under way. A room has been cleared for the assembly, the salesmen sit in long rows on both sides of improvised tables, with their catalogues spread out before them and their special catalogues or manufacturers' lists piled up at one side. At the end of the room is a raised platform, upon which stands a table for the sales manager and several chairs. The sales manager has charge of proceedings, and from his point of vantage can easily see every salesman in the room and single out any man whom he wishes to address personally.

The Discussion.

The jobber's catalogue forms the text book. It is opened at the beginning and the first line taken up and thoroughly discussed. The buyers are usually within easy reach, and in fact the man who buys any line generally manages to be on hand when it is canvassed. The manager tells his story concerning the goods; the salesmen tell of competition they have to meet. If the trade in one section is wedded to a different brand or style the salesman makes it known. If competing goods are deemed by a salesman to be superior, the buyer is ready to defend his choice and explain why it was made. If the discussion proves that the right goods are not being handled, or that the price is too high—higher than other jobbers pay—the buyer notes the particulars. With a force of 60 men handling the goods on the road and visiting a dozen States a great variety of opinion and experience is garnered, and it here finds expression through the lips of the salesmen. The fullest and freest speech is encouraged, and before the subject is exhausted the line has been viewed from almost every possible aspect. Each line is treated in the same manner, and after the catalogue is finished the manufacturers' lists of new lines are covered.

Ground Thoroughly Covered.

Several boys are in attendance to run errands. If in the course of the talk it becomes advisable to have a sample one is sent for it. Before the close of the convention each of the department managers has been summoned to have a talk with the salesmen, and at times lively tilts occur when the entire force decides to express its disapproval of any method pursued. The officers of the company appear at intervals and add a word here and there as desired. Once in a while a man who has failed to sell a specified line is led to say why, and in the discussion of methods he gets information that is of value. At other times, when a salesman has made an unusually good showing the fact is mentioned. Every possible comparison is made and every fact and feature brought out, and when the convention closes there is not a man who has attended its sessions who is not better equipped for having been there. The buyers' notebooks are full of memoranda; the pad beside the sales manager's desk has been renewed several times, and enough light and knowledge have been gained to show that the meetings have been profitable. The effect is seen for months afterward, and not infrequently whole lines are changed and others substituted to enable the men to sell to better advantage. The sessions are noisy and without formality. Every one who has an idea or an objection gives it vent. The shipping desk, the cost clerk, the stockman, the sample clerk, the head of the packing room, the financial man, the routing clerk—all have been called in as their work has been mentioned and have had a chance to defend themselves against criticism, and every man has a hightened sense of responsibility for his work.

Out-of-Session Work.

When each session ends the work goes on with a different aspect. A little knot surrounds the sales manager wherever he goes. Little gatherings of salesmen converse in odd corners and routes, customers' peculiarities, methods of approaching different men and other matters of interest are discussed. Every department of the house is visited time and again by the different men who are looking after their customers' welfare and getting posted—and, in fact, there is little done all through the week except to care for the salesmen. Usually a dinner on Friday night ends the convention, but it is not until late Saturday afternoon before the last salesman has disappeared and the men in the house are able to think of the ordinary routine of their work.

Strength Through Association.

In addition to the benefit derived from a free discussion of the business, the salesmen gain a moral strength and support from the week of association they could gain in no other way. In his ordinary routine, the salesman stands alone and unsupported for most of the time. His house is at a distance, and unless he meets a fellow traveler at a junction there is no one with whom he can exchange confidences and house news. The men who do not travel can hardly realize the amount of assistance the constant association with their fellows gives them, and the way in which their wits are brightened by constant discussion of house topics. This annual elbow-to-elbow touch does a great deal for the salesman. He realizes that others find the same stumbling blocks he does, and things are seen from a different point of view after such an experience.

Helpfulness and Equality.

It will be noticed that in these meetings each of the newer men gets into close touch with one of the older ones and the two go the rounds together. The older salesman helps the newer one with the unfamiliar catalogue, and in various ways aids in dispelling the feeling of newness which the later comer has. Throughout the entire week there is displayed by all a spirit of mutual helpfulness and frank equality that is very enjoyable, and is a tribute to the worth of the sales manager, for if his work throughout the year were not pervaded with this same spirit and feeling it could not be found here.

READING HARDWARE COMPANY.

UNDER the title of "Some Buildings Wherein Are Locks and Hardware Made by the Reading Hardware Company," are artistically grouped the photographs of 143 buildings, which have been erected at various places throughout the United States, together with a list of the architects and builders who have appreciated the merits of the Reading production. The photographs have been reproduced upon highly sized paper, loosely bound between board covers, 10¼ x 14 inches. The frontispiece of the semi-art portfolio is an illustration of the company's factories at Reading, Pa. Samples of various designs and finish of the Builders' Hardware used in the furnishing of the buildings adorn the pages opposite to the photographs of the buildings. Among the more important buildings shown are the following: Monadnock Block, Chicago; Stephen Girard Building, Philadelphia; Broad Exchange Building, New York City; Merchants' Loan & Trust Building, Chicago; Appellate Court Building, New York City; St. Paul Building, New York City; Marshall Field & Co.'s Building, Chicago; Stewart Building, Chicago; Philadelphia & Reading Railway Terminal, Philadelphia; the Bourse, Philadelphia; Presbyterian Building, St. James Building, Exchange Court, Del-

monico's, and National Bank of Commerce, New York City; Hartford Building, Chicago; Minnesota State Capitol, St. Paul; Twenty-third Regiment Armory, Brooklyn.

Letters From the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Prices in Window Displays.

From a Wisconsin Hardware Merchant: I notice in your issue of May 14 an article on window dressing by Wm. H. Miller. Although he has handled this subject in a very comprehensive manner, I want to take exception to his contention regarding price cards in the window. Without them the display is only half done. They are a silent salesman, working at all times and doing it thoroughly.

It is a known fact that people dislike to come into a store merely to inquire about the price of an article displayed in the window. You may have an article in there which is beyond their means, and if the price is omitted they will either pass by or feel that if they do inquire it will put them under obligation to buy. Then again, an article may really look expensive and would not attract much attention, yet when a low price is put upon it its selling power is enhanced and will save many annoying questions.

The window is as much of an ad. as the one in the paper, and I contend that if prices can be mentioned in the latter (which they should be) it is more important to place price cards in the window. If the big department stores can use this method with success there is absolutely no reason why the little fellows cannot do it also. Put a neat price card on any article you place in the window and you will find that its power of attracting attention is increased a hundred fold

Jobbers Retailing.

From a Michigan Hardware Merchant: I am very favorably impressed with your suggestions as to retail representation at gatherings of jobbers and manufacturers, and think if a delegation of retailers were invited to attend a convention of the jobbers and were granted a hearing much benefit might be derived by all concerned.

My work in the Michigan Retail Hardware Dealers' Association has taught me that there exists a feeling between the retailer and jobber that is not harmonious. This is especially so in the Middle West, where most all jobbers do more or less retailing, thus forcing the retailer as much as possible to buy goods directly from the manufacturer, the jobber losing his percentage and the manufacturer being the only one benefited. This has compelled the retailer to buy in larger quantities, oftentimes to his own detriment.

I for one maintain that the proper way for the manufacturer to distribute goods is through the jobber, but this cannot be done as long as the jobber infringes on the rights of the retailer.

Syndicate Buying.

From a Western Jobber: I am well aware that there are two sides to this important question. Business men who are sincere and honest in their convictions believe in syndicate buying as a useful and legitimate department of the trade. The sharp competition among jobbers has caused goods to be sold on closer and smaller margins, until profits are cut down at times below a living or safe margin.

Can this difficulty or state of affairs be made better and more remunerative to the jobber by a syndicate buyer? As a usual thing I think not. I believe if the manufacturers were to reduce the quantity limit so that all recognized jobbers could purchase the amount demanded by the manufacturers at any one purchase without being overstocked, and selling this amount to the jobbers as low as any syndicate buyer could buy a larger amount for, it would solve the problem and the syndicate buyer would have to go to the large retail trade for business, which would be so insignificant and unprofitable that he would soon go out of the business.

I believe any recognized jobbing firm with good credit and undoubted integrity for honesty and fair dealing should be sold goods by the manufacturers as low and on as liberal terms as any syndicate buyer could purchase the same goods for, even if a larger amount were purchased. If this principle or method was carried out in full I believe those now employing syndicate buyers would soon find that they had no more use for them, and would soon become active advocates in favor of abolishing the practice.

Jobbers and Catalogue Houses.

From an Illinois Hardware Merchant: It is difficult to get accurate and detailed information as to the volume of business done by Chicago jobbers with the catalogue houses. That the volume is large is evident from the frequent calls made on them by the pick up wagons of the catalogue houses. This applies no more to Hardware than to dry goods, groceries and other lines.

The catalogue houses are the greatest disturbing element in modern merchandizing, and Chicago is where they seem to thrive best. If all the various trade associations will unite in urging the jobbers to refuse to sell catalogue houses I believe it will be productive of good.

Getting Together.

From an Officer of a Western Association: I believe there would be a great many advantages derived from representatives of the retail Hardware trade meeting with the jobbers and manufacturers. I cannot see where there would be any disadvantages. It would certainly do no harm, and might be conducive to a better understanding between all parties. I find that it is a great benefit to "get together" and confer together. It clears up many misunderstandings and is conducive to nothing but good to all concerned.

Conferences Between Jobbers, Manufacturers and Retailers.

From an Indiana Hardware Merchant: I am heartily in accord with the measures suggested in your editorials and believe that much good will result from joint conferences of manufacturers, jobbers and retailers of Hardware and kindred products. From my observation of such meetings I am sure that they tend to bring about a better understanding between manufacturers and distributers.

I think the experiment should be made, and if the three elements represented will meet with the intention to be fair in all their discussions a great good will result. I think one of the most effective means to counteract the "cat" house competition may be found in a combination of the three elements to fight against this common enemy of the retailer.

Assignment of Employees' Wages.

From a Representative of Large Hardware Interests: Referring to article on the above subject in *The Iron Age*, issue of May 21, our experience is that it is not a good thing to discharge an employee simply because he has been borrowing money from one of the money lenders. We do not believe it remedies the difficulty, and furthermore seems to be an injustice to the employee—it gives the money lenders an additional club to hold over the heads of these unfortunates, who are forced either by their own mistakes or their misfortune to borrow money, since said money lenders go to such parties and state that if the accounts are not paid, irrespective of all other obligations, the fact will be brought to the attention of the employer with the certainty of the employee losing his position. We know of one man who paid 20 per cent. a month because of such threats.

Our plan is an entirely different one, and as far as we know seems to be absolutely successful, and is about

the only successful one that has been brought to our notice. We instruct our employees that any of them are at liberty to borrow from these money lenders as much as they please, *provided* always they notify us when the contract is made. We take the position that having a contract with them for the payment of a salary we have a right to know if in any way they compromise that salary or obtain a loan on the strength of such salary. In those cases where they advise us that they have borrowed money from a money lender, when the matter is brought up by the money lender's demand for the payment of usurious rates of interest we have the employee make a tender to the money lender of the principal with the accumulated interest at the legal rate; if the money lender refuses this, then the employee, under our instructions, states to said money lender that he is perfectly willing to have the matter taken into court. One case was thus brought to trial by a money lender with the result that the court decided against him. He was forced to accept the principal with the legal rate of interest. There is a law practically in every State which protects borrowers in such cases.

It has now come to pass that money lenders recognize this fact and also realize that, in spite of their very carefully written contracts, they cannot swindle our employees, and have accepted the employee's tender as instructed by us. Of course this soon became known and the money lenders now are unwilling to make any loan to our employees when they learn our method of procedure and that we are practically back of our employees. Our rule also involves the immediate discharge of any employee who has made an arrangement of this kind and borrowed money from these people without notifying us. The fact that they can borrow with entire impunity and without losing their position if they notify us, and will lose their position if they do it without notifying us, has simplified the matter and practically solved the difficulty.

Supplying Catalogue Houses.

From a Prominent Hardwareman in Illinois:

If the Western jobbers in all lines persist in their present programme of carrying stocks for the catalogue houses to do business with, I anticipate that a few more years will bring this matter to a focus and the jobber will have to refuse to sell the mail order house or lose entirely the trade of the cash buyers among the dealers.

WISCONSIN RETAIL HARDWARE ASSOCIATION.

THE Executive Committee of the Wisconsin Retail Hardware Association met on the 27th ult. at Oshkosh, Wis., to hear the report of the special committee appointed at the annual convention in February last to look into the advisability of forming a fire insurance company. The report was of a favorable character, and articles of association were adopted preparatory to asking the members to avail themselves of the benefit of the insurance feature of the organization work. It is now up to the members to push the project successfully through. It will be necessary for the company to have at least $100,000 in applications before any policies can be issued, but the committee do not think it will be difficult to secure this amount, as $15,000 worth was pledged at the meeting, and $30,000 additional is in sight before soliciting has actually commenced.

AT the annual meeting, May 28, of the directors of the Retail Hardware Dealers' Mutual Fire Insurance Company of Minnesota, President Chas. F. Ladner, St. Cloud; Vice-President J. F. McGuire, St. Paul; Treasurer H. Hauser, Minneapolis, and Secretary M. S. Mathews, Minneapolis, were unanimously re-elected for the ensuing year. The statement of the secretary for the first five months of the present year showed a flattering increase in business, as well as a healthful financial condition. Insurance written during the year amounted to $618,443, carrying premiums of $15,491.62. Losses were but $1666.26, and expenses $1308.49. The sum of the losses and expenses was less than 20 per cent. of the premiums.

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BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., May 23, 1903.

The Week's Hardware Trade.

REPORTS touching the state of the Hardware trade vary considerably this week, although, on the whole the business outlook may be regarded as more promising. Hardwaremen in the metropolitan district, in common with other traders, charge the cold and wet spring season with being the cause of slow business. The dull weather has also had a depressing influence upon the sales of Agricultural Implements, particularly those which are required in the early part of the season. Producers of material in the Midlands are in agreement that there will be little betterment in the outlook from their point of view until after the Whitsuntide holidays. The tone of the iron market is therefore steady. Though new business continues scarce, employment continues good in all departments covering finished iron.

Manufacturers of Hardware generally regard the business situation as more hopeful. Birmingham brass founders are reported to be busier than at any time this year. On the other hand, those engaged in the Gun, Cycle and light trades complain of quietness. Sheffield also complains of lack of business in Cutlery and Plate, but good business is being done in Edge Tools, both for home and South African orders. In the Lancashire district there are complaints of general sluggishness in the Hardware trade. A feature is the large amount of business which is being done in Wire Netting, but prices are said to be cut very fine. Orders for manufactured metal goods generally are given out very sparingly.

The Mercantile Year Book.

I have received from Walter Lindley Jones & Brother of 21 St. Helen's Place, Bishopgate street within, London, E.C., the seventeenth edition of the Mercantile Year Book and Directory of Exporters. In each case the special department undertaken by the exporters is specified, whether it be dry goods, drugs, Hardware, Metals, Machinery, Electrical Goods, or what not. The list of exporters covers London, Manchester, Liverpool. Birmingham, Glasgow, Bristol, Nottingham, Paris, Hamburg, Berlin, Bremen, Amsterdam, Rotterdam, Antwerp, Genoa and New York. I have known this Year Book for some years past, and can testify to its general accuracy and up to dateness. The price is $2.50.

The Ivory Trade.

The Antwerp ivory sales, which concluded last week, and at which the great quantity of 93 tons was offered, passed off with keen competition throughout. This was more especially the case on the second day, when there was some heavy buying on behalf of America, in compliance with late advices. Large teeth realized from £2 to £3 per hundredweight advance; medium teeth from £1 to £2 and small teeth about £1 over last sales. Notwithstanding the several small advances that have taken place at recent sales, local dealers do not consider it advisable to make any alteration in their lists at present, but in the event of a marked revival in the local trades prices would certainly stiffen. There has been no advance in list prices since November, 1901. There is an improving demand for many classes of handles.

High Class Steels.

There is an increasing demand for steels, from which to manufacture tools for high speed machinery. It is still noticeable that these steels are used much more freely on the continent than in this country, and machinery in many of their places being much more up to date. At the present time a series of experiments is going on at the university at Manchester with these steels, and several Sheffield manufacturers have been asked to send in samples to be tested, and this has been done. A representative of the firm whose sample is under consideration is allowed to be present. As to the results, nothing is at present known, or will be known until the tests are completed and the results tabulated. The demand for best steels is fairly good, but in common steels there is less doing and complaints of dullness are general.

An African Concession.

We often hear of concessions that have been obtained from the overlords of territories with which industrial nations desire to trade. Being about to pay a visit to the northwest coast of Africa, I have been inquiring into the commercial situation there, and in the course of my search I heard of an African sheik, who is at the present moment in this country, endeavoring to obtain capital to work a concession which he obtained from a Sultan over territory lying south of Morocco. Getting into touch with his agent I was shown a copy of the instrument or deed conveying to him certain trading rights over the district in question. I give an almost literal translation of the Arabic, first, because of its intrinsic interest, and secondly, because inferentially it shows the kind of business to be done in a country which is just as open to American ships as to any other:

In the name of God, the merciful, the compassionate,
May the Blessing of God be upon our Lord
Mohammed, the best of mankind and
the seal of apostles.

Whereas, This is a covenant between us, we Muhammad, the son of Admad-Al Ayyedda, and Wald Beyrook and our friend Muhammad-Al-Sabbar. May God be gracious to us and to him and to all Believers.

Firstly. We the above named, in a state of independence in our territory and amongst our tribes, having no ruler over us except God alone, and having complete possession and full power to concede to whomsoever of men we please the permission to enter our territory and our settlements, having conceded to our dear friend Muhammad-Al-Sabbar that he, his partners, his servants or whomsoever he may appoint, may enter our territory for the purpose of trading or working the mines that exist therein (we having absolute possession and sovereignty), wheresoever and whensoever they may please during the continuance of the period granted to them, which last shall extend for 21 years from the date of this covenant. And we take upon ourselves during all this period above mentioned that we will prevent any person whatsoever beside them from entering our territory for the purpose of trading or working the mines of whatsoever country or nation he be, except in the case that the above named Muhammad-Al-Sabbar and partners shall have decided to leave our country before the expiration of the period granted to them as above specified. And we have conceded also and granted and given permission to the above named Muhammad-Al-Sabbar, his partners and agents to build houses to dwell in, and magazines and warehouses to store their supplies and merchandise in, in whatsoever place they may deem suitable or necessary for the same, without hindrance or interference from anyone either by sea or land. And we have conceded to them also and granted and given them our permission to build a jetty or jetties for shipping merchandise and landing supplies whenever it may be necessary. And we also conceded to them the power to drive a railway from the jetty or jetties to the localities of the mines which they may wish to work in order to facilitate the conveyance of the ores therefrom to the seashore, and for the purpose of trade also if the same should be necessary or convenient to them or to us. And the above named Muhammad-Al-Sabbar and his partners shall have the right to build and establish harbors on the sea for the purpose of sheltering the vessels and ships and to protect and preserve them from hurricanes, storms and heavy winds whenever they may arise and from the violence of the sea when it is in a state of disturbance and agitation during the winter season.

Secondly. We have given to our friend Muhammad-Al-Sabbar, his partners, agents and servants, a solemn promise by God, and his Prophet (may God bless him and give him peace) that we will neither molest them ourselves nor permit anyone else to molest them, or injure them or their property in any place or at any time under any conditions or circumstances during the whole period of their stay in our territory under our protection and in covenant with us. And whoever shall annoy, injure or insult them shall make restitution in accordance with his offense and his desert, whether he belongs to tribes that are in our country and under our authority, or to other tribes under the authority of other chiefs, whether they be near us or far away from us.

Thirdly. The above named Muhammad-Al-Sabbar and his partners have undertaken upon themselves that, at the expiration of the above-mentioned period which has been granted to them (namely, 21 years) to deliver over to us whatever building they may have erected, whether dwelling houses or warehouses and magazines for merchandise and supplies, or jetties and harbors, &c., &c., and they shall not keep possession of any of them, nor shall they

have the right to lay their hands upon any of them, nor shall they make any claim upon them, or take of them or of their value a single farthing, except in the case that they may have wished to renew this covenant a second time, when they may make use of them until they depart from our territory.

Fourthly. The above named Muhammad-Al-Sabbar and his partners have undertaken to pay of their own money to us the sum of ——— at the end of every lunar month on account of our kindness and friendship, and of the permission which we have given to the said Muhammad-Al-Sabbar and his partners to enter our territory and settlements and trade therein, and work the mines thereof, in accordance with the conditions agreed upon between us and them until the termination of the above mentioned period, the duration of which shall be 21 years from the date of this covenant. And we have granted permission, and have accepted and agreed to these conditions with the above named Muhammad-Al-Sabbar and his partners, and we have given them a solemn promise by God and His Prophet—a promise which may neither be altered nor changed, even should the heavens themselves be altered and the earth be changed. And we call God to witness against ourselves herein. For He is the best of witnesses, the most generous of benefactors, and the bountiful of givers to those that ask. Amen. Amen. Amen.

O Lord of the Worlds.

Initial Developing Processes.

This concession covers 200,000 square miles, the greater portion of which contains a considerable proportion of Berbers, living for the most part in large walled towns in the interior, with the inhabitants of which, so I am informed, an extensive and lucrative trade can be carried on. The trade is, of course, worked over caravan routes, and the first step would be to dispatch a suitably equipped expedition with a large cargo of merchandise composed of goods most in demand with the natives. This expedition, wherever it went, would be accompanied by representatives of the ruling Sultan, who would extend to it protection. It is in this way and by these means that so much of Great Britain's trade in tropical countries has been built up.

Trade with Northern Spain.

Recently in *The Iron Age* I reported upon an important movement in the province of Biscay for the stimulation of the agricultural industry, involving the purchase of Agricultural Implements on a large scale. A report just to hand from the district of Bilbao amplifies what I then said. Some 15 years ago an effort was made to raise the condition of agriculture by the introduction of improved machinery, but an insurmountable obstacle was encountered in the lack of mechanical knowledge among the working rural population, who destroyed the different parts and accessories of the new machines faster than they could be replaced. With few exceptions, country properties consist of separate plots, difficult to work with machinery, owing to being scattered. Laborers' wages have, however, increased during the last few years, and land owners are being forced, in their own interests, to adopt more economical and improved methods of cultivation.

Importation of Sowers, Reapers, &c.

An importation, small in its beginnings, but well worth the attention of American manufacturers, has begun in Agricultural Machines, such as Sowers, Reapers, Threshing Machines and Binders. The Deputacion Provincial has placed itself at the head of a movement for enabling farmers in the Basque provinces to acquire modern implements at cost price. A depot will in all probability be established in Bilbao in connection with a number of model farms. Among other articles that will be required are Harrows, Plows of the Bravant double type, Root Cutters, Hand Winnowers, &c. According to one Bilbao agent 50 machines of various kinds were sent from the United States in 1901. Of these two-thirds were sold and distributed throughout different parts of Spain. The number in 1902 was still larger, and an increased importation is expected during 1903. Profiting by previous experience, large supplies of additional parts are furnished with these machines. British Agricultural Machinery has been tried and condemned as being too heavy for practical utility. The draught animals of the country are small, which makes lightness an essential consideration with Spanish purchasers of Farming Machinery. American Binders are less durable than many of British make, but are cheaper and admirably adapted in weight to Spanish requirements. American catalogues seem to be perfect specimens of their kind, being printed in Spanish and very attractively colored.

Pumping Machinery.—The future should bring a demand for Pumping Machinery for irrigation purposes in the interior provinces. Just as a direct leap was taken from primitive Oil Lamps or total darkness to electric lighting in even the humblest dwellings of the working class, so there is a desire, born of opportunity, to pass from the archaic Water Wheel (Noria), with its esparto Rope and Earthen Ware Bucket, to the most modern and economical water lifting appliances. Progress is slow and considerably retarded by the fact that the new machinery does not always get fair play at the hands of its inexperienced users, but there is a movement forward of which American manufacturers should be ready to avail themselves.

Sheffield Tools and Cutlery.—Sheffield Tools hold a leading place on the Bilbao market, but British Cutlery has no chance against that of German make, owing to the greater variety and choice offered by the Solingen cutlers, who will, it is said, supply special models for any given province of Spain. A current article in the Basque districts consists of Iron Nickel Handled Knives at 1 franc 75 centimes (34 cents) per dozen.

Files.—American Files are making their way into the Bilbao trade, owing principally to the fact that 70 per cent. discount is allowed, and prices are quoted franco Bilbao. Their lightness also offers an advantage, owing to the high customs duty levied by weight. As a set off British Files, while heavier, have more metal and better temper, and will bear recutting, which the American will not. Files of native manufacture do not offer any obstacle to importation, as they are inferior in quality and have failed to secure popular favor.

Nuts, Bolts and Screws.—In the important articles of Nuts, Bolts and Screws, Belgium and France have the monopoly. British Screws are not considered in Bilbao to be as well finished as the Continental, and the decimal sizes are said to offer greater variety of selection. A fact which tells perhaps most of all in favor of the Belgian and French trade is that these makers produce other articles in addition to Screws, and Bilbao dealers find it convenient to order more than one commodity from the same firm. British Screw makers, as a rule, limit their business to that single article.

Light Enameled Ware.—The United Kingdom, which furnishes the material for the manufacture of Light Enameled Kitchen and Household Ware, does not compete against the low priced goods imported from Belgium, Switzerland and Austria-Hungary. The sale of Cast Iron Enameled Utensils, in which the United Kingdom used formerly to do business with Bilbao, has shrunk of late to about a third of its old amount, while more than one wholesale dealer asserts that he could now sell as much as $40,000 worth of the Light Enameled Ware during the year.

Hand Saws.—American Hand Saws show a tendency to push the British out of the market, owing, it is said, to the care taken in their tempering. Saws from the United States can usually be relied on, whereas a consignment of British Saws is said invariably to show a percentage of defects.

Electric Light Bulbs.—An important item of present importation consists of Incandescent Electric Light Bulbs, of which 224,806 appear in the import returns for 1902, an increase as compared with 1901 of 186,777 Bulbs. These were all of German origin. The most usual numbers are from 5 to 25 candles. The wholesale price, f.o.b. was 35 francs per 100 Bulbs, the customs duty payable thereon being 20 pesetas ($2.80). Native manufacturers of Incandescent Bulbs, of whom there are several, do not yet produce an article of first-rate quality, but they will probably improve, as electricity has taken firm hold in Spain. Retail prices for native Bulbs are from 70 to 75 pesetas ($9.84 to $10.56) per 100. The Germans have also taken a firm hold of the trade in Electrical Appliances, and, owing principally to the resources and enterprise of a well capitalized com-

pany in Bilbao, have secured something like a monopoly of all large installations. This is a matter of considerable interest to makers of Copper Wire.

TIN PLATES.—There are two Tin Plate works in Bilbao, which produced during 1902:

	Quantity. Tons.
Iberia works	5,171
Basconia works	3,515
Total	8,686

British Tin Plate, of which several thousand tons used to be imported annualy, has almost ceased to find a market in Bilbao.

The Iberia Works now form part of the United Altos Hornos Works, from which their supply of Steel Bars is drawn. The Basconia Works erected plant in 1902 for the production of Siemens' steel, and have contracted with new works at Santander for the supply of Pig Iron. They expect to produce annually 35,000 tons of steel for the manufacture of their own Plates, Buckets, &c., and for the supply of the general market.

BLACK PLATES.—The importation of Black Plates from the United Kingdom in 1902 was under 600 tons, of which the larger part were cases of 112 sheets of 20 x 14 inches, and 20½ x 13¾ inches, of 85 pounds weight. The importation is expected to diminish, as, although the British quality is superior to the Spanish produce of the Iberia and Basconia works, where Black Plates are manufactured, these factories have lowered their prices with a view to stopping foreign competition. Black Plates are used in considerable quantities by a Bilbao company, who tin and manufacture them into printed Plates for canning purposes.

PRICES OF TIN PLATES.—Current prices for the three classes of Spanish Tin Plates most in demand in 1902 were:

Case of—	Weight Pounds.	Currency. Pesetas, c.	Dollars.
112 sheets 20 x 14 inches	108	32 50	4 56
224 sheets 14 x 10 inches	90	29 0	4.08
	90	30 0	4.20
50 sheets 25 x 17 inches 100 sheets 17 x 12½ inches	126	41 0	5.76

Two per cent. discount was allowed for payment within 30 days, 90 days' credit being given without discount.

BRASS AND COPPER TUBES.—Bilbao possesses the sole manufactory of Brass Cased Tubes in Spain. The production during 1902 was approximately:

	Quantity. Tons.
Brass cased tubes	350
Brass and copper tubes	250
Brass sheets	600
Iron tubes	800

Owing to the absence of Copper smelting works ingots required for making Brass are imported from the United Kingdom, the heavy duty of 225 pesetas ($31.68) per ton thereon adding greatly to the cost of production. The protective duty, however, on manufactured Brass Tubes is 580 pesetas per ton ($81.36), so that foreign made goods of this class are driven out of the market. The only sizes of Brass and Copper Tubes imported from the United Kingdom are those above 2½ inches in diameter, which are not made in Bilbao. France and Germany, however, are beginning to undersell the United Kingdom.

IRON AND STEEL TUBES.—The Sociedad Tubos Forjados, at Elorrieta, produced in 1902 the following quantities:

	Quantity. Tons.
Bedstead tubes	1,215
Water, gas and steam pipes	1,625
Boiler tubes	450
Accessories	60
Total	3,380

WIRE.—The Franco-Española Company, at Erandio, near Bilbao, produced during 1902:

	Quantity. Tons.
Frames for aerial tramways	400
Cast steel wire for cables	600
Iron wire for the trade	500
Cables	600
Total	2,100

In addition to the foregoing about 2500 tons of Wire were made at the Santa Agueda Works, and a similar amount may be estimated as the output of a third factory called Alambres del Cadagua.

TRADE ITEMS.

WM. A. ROGERS, LIMITED, manufacturers of Silver Ware and Cutlery, with factories at Niagara Falls and Oneida, N. Y., and Northampton and New Bedford, Mass., have decided on a plan for concentrating most, if not all, of their manufacturing interests at Niagara Falls. With this end in view they have just closed down the New Bedford plant, and will remove the machinery, &c., as quickly as possible. It is not, however, likely that any of the other factories will be moved this year.

THE PHILLIP GROSS HARDWARE COMPANY, Milwaukee, announce that they have taken a contract for furnishing the Hardware for a residence which is being erected at Bonn, Germany, for Oscar Thilmany, a prominent mill owner of Kaukauna, Wis. Mr. Thilmany has retired from active business, and is now living at Bonn. It was Mr. Thilmany's desire to have his German home finished on a thoroughly American plan, and to this end it was the original intention to export all the interior wood work from Milwaukee, but the idea was abandoned because of the excessive duty. American Hardware, however, has been contracted for, Stanley Ball Bearing Butts and Locks and Trimmings manufactured by the Chicago Hardware Company having been secured. The designs are of the latest patterns and the material is of the best.

THE GEORGE GRIFFITHS COMPANY, Keystone Shovel Works, 511 Locust street, Philadelphia, Pa., suffered a loss estimated as $20,000 by fire on the 28th inst. The principal damage was to the third floor of their factory, although water damaged a large stock of finished goods.

THE attempt to unionize the shops of Smith & Wesson, Pistol manufacturers, at Springfield, Mass., as noted in our last issue, proved to be a fizzle. The shops were shut down on May 25, and employees were furnished with blank statements, and told that if they returned to work they must affix their signatures to the statements, which read: "I hereby affirm that I am a member of no labor union whatsoever, and agree that I will not join any such union while in the employ of Smith & Wesson without notifying them in writing of my intention of doing so." The shops started up again Monday morning, June 1, with 480 of the 500 employees back in their old places, all having signed the agreement. The other 20 were willing to return to work under the agreement, but the company took their cases under consideration, these men being understood to have been overactive in the movement to establish a union. The incident is now considered closed. This treatment of the case by Smith & Wesson has caused a good deal of favorable comment among manufacturers throughout New England, where similar classes of labor are employed.

COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio, have issued the first package of a series of blotting pads, with selections by their poet, "Old Timer." The company report business as excellent and the number of their customers as steadily increasing. Before the close of the year they are intending to add a number of important lines to their products.

E. T. NICOLS AND J. Q. A. SAND have lately entered the manufacturers' agency business at 128 South Calvert street, Baltimore. Mr. Nicols has been identified with the Hardware line for a period of more than 22 years, having served ten years as clerk before branching out on his own account in a store at Easton, Md. For the past two years Mr. Nicols has traveled on the road locating agents for D. M. Osborne Company, manufacturers of Harvesting Machines. Mr. Sand has for the past six years been in the employ of Henry Keidel & Co. of Baltimore.

H. C. SLINGSBY of England, manufacturer of Slingsby's Patent Hand Trucks, is at the Waldorf-Astoria Hotel, New York, on a mission to this country, the object of which is the extension of manufacturing facilities in both the United States and Canada, one factory having been in operation in a neighboring State for some time.

We are advised that they have in all four factories, 25 branches, and many agents in various parts of the world. A catalogue of 500 pages for gratuitous distribution illustrates, describes and gives prices on nearly 1000 different kinds of Trucks for almost any purpose, which can be obtained by addressing the New York branch, H. C. Slingsby, Postal Telegraph Building, 253 Broadway.

STREVELL-PATERSON HARDWARE COMPANY.

AMONG recent visitors to the office of *The Iron Age* was James H. Paterson, formerly of Chicago, but now a resident of Salt Lake City, Utah. Mr. Paterson has been spending several weeks visiting manufacturers of Hardware in the interest of the Strevell-Paterson Hardware Company, successors to the George M. Scott-Strevell Hardware Company, Mr. Paterson being vice-president and treasurer of the new company. He speaks glowingly of the opportunities enjoyed by the location of their establishment in the capital city of Utah. The business was established a number of years since, but with the organization of the new company a decided departure will be made in the conduct of their affairs. The old company had conducted both a wholesale and retail store. They have disposed of the retail part of the business, which will hereafter be conducted by the King Stove & Hardware Company.

The old building devoted to the wholesale department is being torn down and a much larger structure is to be built on its site. It will cover a ground space of 60 x 160 feet, and will consist of five stories and a basement. It will be thoroughly equipped with all new devices for saving labor and enabling bills of Hardware to be gotten out expeditiously. This building will be used for handling Shelf Hardware and such small articles in the Hardware line as are most suitable for city trade or for shipment in small packages. The company also have a brick warehouse located a few blocks distant along the railroad tracks. This warehouse is 65 x 150 feet, two stories high, and is used for the storage of Sheet Iron, Stoves, Wire Nails, Wire, Tin Plate, &c. Tracks run into the warehouse on the side and end, enabling receipts and shipments to be made directly by rail.

The territory covered by the company extends from a short distance west of the Rocky Mountains to the Sierra Nevada range in California, north into Montana and south to Arizona. It is a very rich agricultural and mining section, and the consumption of Hardware is steadily increasing. The stock carried covers Mining Hardware, as well as Shelf and General Hardware. The company now employ five traveling men and expect shortly to put on five more.

In the acquisition of Mr. Paterson the company have secured the services of a capable and most experienced Hardwareman. Mr. Paterson has been engaged in the Hardware business since he was 14 years of age. He spent 32 years on Lake street, Chicago. He had been vice-president of the Wells & Nellegar Company for over 20 years, retiring from that establishment only because he felt that greater opportunities were presented at Salt Lake City.

BEECHE, DUVAL & CO. AND WEST COAST PACIFIC TRADE.

BEECHE, DUVAL & CO., Broad-Exchange Building, New York, have just issued a useful 12-page booklet of information concerning their West Coast Line. On the front page is an outline map of South America, showing all the ports from Punta Arenas (Sandy Point) in the Straits of Magellan, north to Guayaquil in Ecuador. The next page contains general instructions in shipping to the various west coast countries. This is followed by a page each of practical information concerning Chile, Peru, Bolivia and Ecuador, with consular charges relating to each country in the order given, with the names of the Consul-General of each country and address in New York. The last page gives distances from Dungeness Point (the entrance to the Straits on the Atlantic side) to the 36 ports northward to Guayaquil.

This house, whose headquarters is in Valparaiso, Chile, have been operating steamers to these ports for about 30 years, and were the originators of steam service to the west coast, the American branch then being Hemenway & Browne, Boston. Early in the nineties the business was removed to New York, where it has been carried on under the successive titles of Browne-Beeche & Co., Beeche & Co. and Beeche-Duval & Co., as now. The present service has been in regular operation for about ten years, and for about seven years the regular line from New York has employed from 6 to 12 steamers. The bulk of the cargo has usually been their own merchandise consisting of almost everything, but largely of Railway Material and Supplies, Kerosene and Lubricating Oils, General Hardware and Wooden Ware, Agricultural Implements, Cotton Goods, Lamps and kindred lines. The returning ships bring nitrate of soda, ores of all kinds, but principally silver, sugar, hides and skins and certain kinds of a long staple cotton used here to blend with wool to strengthen the fabric. One leading article of export, that of manufactured iron and steel, has fallen off largely since the era of higher prices here, but they expect to regain the trade when a recession in price comes.

SCARCITY OF SKILLED LABOR.

THE manufacturers of high grade Edge Tools are finding that it is well nigh impossible to get enough skilled grinders. Advertising fails to bring the right kind of men. The ordinary grinder, such as is employed in Axe factories, is not scarce, but the genuine "tang" grinder is as scarce as hens' teeth. For instance, the Buck Bros. Company of Millbury, Mass., have employment for four more expert grinders, but are unable to get them. The trade seems to be confined to Englishmen, and they preserve the secrets of their craft with exceeding jealousy. It is very rare that one of them will take an apprentice, unless it be his son. Such grinders may be procured in England, but the contract labor law steps in and handicaps the American manufacturer. Occasionally an English grinder finds his way to America, told by some one of his fellows already on this side of the ocean that good wages and steady employment await him here. This is really the only chance of the American manufacturer of fine Edge Tools to get a new grinder. The skill of these workmen is remarkable. They take the forging for a tang tool and grind it and polish it on the same stone, beveling the edge of a beveled edge Chisel, for instance, doing it all by the eye, and so exactly that it is impossible to tell one tool from another. The pay of these men is high, the skill and dexterity of some of them enabling them to earn as high as $60 a week piece work.

AMONG THE HARDWARE TRADE.

The Hardware department of the Parks Mercantile Company, Crystal Falls, Mich., has been incorporated as a separate concern under the style of the Parks Hardware Company, the capital being $10,000, fully paid. The lines handled include Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c.

M. E. Haight has purchased the Hardware, Stove and Sporting Goods business formerly conducted by Jos. Kunck in Crete, Neb.

The Valley Lumber Company, with headquarters at Hillsboro, N. D., who operate a number of branches, have taken up the sale of Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c., in connection with their lumber business at Shelly, Minn.

A. H. Fogg Company, Houlton, Maine, have just taken possession of their fine new store in the Fogg Block. The store is large and commodious with abundant light. Warren Shelving has been installed, and every effort has been made to make the store as attractive and convenient

as possible. The company are thus in excellent position to take care of their large and steadily increasing business.

Northern Hardware & Supply Company, Menominee, Mich., have purchased the business of the Prescott Supply Company, Marinette, Wis., the stock consisting of Pipe, Fittings, Valves, Packings, Leather and Rubber Belting, Wood Split Pulleys, &c., in fact, everything required for the saw mill, factory and mining supply trade. Possession was given on the 1st inst., and the stock will be removed and consolidated with their Menominee business as soon as possible. Harry S. Prescott of the former firm has accepted a position with the Northern Company, and will have entire charge of sales in the department of mill, factory, logging and mining supplies. The company will put several additional men on the road and expect largely to increase their jobbing business, especially in the heavier lines.

L. A. Cochrane has purchased the Shelf Hardware, Stove, Tinware, Sporting Goods and House Furnishing business formerly conducted by C. W. Cook at Shawnee, O. T., and intends to incorporate under the style of L. A. Cochrane Hardware & House Furnishing Company. Mr. Cochrane has added materially to the stock thus acquired.

Boyd-Fry Stove & China Company, Valdosta, Ga., is the new style of the business formerly conducted under the name of Boyd, Knight & Co. Since the death of Mr. Knight some 14 months ago Mr. Boyd has assumed possession of his partner's interest, and for a while the business was carried on under the style of Boyd Stove & China Company. A short time since Mr. Boyd sold a half interest to E. Yancy Fry of Valdosta, who has large naval stores interests in that section, and the style was again changed as above indicated. Mr. Boyd, who has been identified with the Stove and Crockery trade for many years, will manage the business. A number of improvements have been made in the establishment and others are contemplated. The firm will continue to handle Hardware, Lamps, Glassware, House Furnishing Goods, Stoves, &c.

The partnership formerly existing between Charles A. Hoff and Robert P. Raymond under the style of Hoff & Raymond, Middletown, Pa., was dissolved on the 23d ult. The business of wholesaling and retailing Hardware will be continued by Mr. Raymond under his own name.

City Hardware Company, Anniston, Ala., have been organized with a capital of $12,000, and the following officers: J. R. Landham, president; H. D. Barr, vice-president, and Ross Blackmon, secretary and treasurer. The company will conduct the wholesale and retail business in Hardware, Agricultural Implements, Vehicles, Harness, &c.

Leader Hardware & Furniture Company have lately commenced business in Exeter, Neb.

W. D. Konantz has succeeded Goodlander & Konantz, at Arcadia, Kan. Mr. Konantz has been connected with the Goodlander business for over 20 years, first as clerk, then as manager, and for the past two years as junior partner. Under his management the business has been very successful, growing from a small lumber yard to an extensive establishment carrying a complete line of Builders' Materials, General Hardware, Vehicles, Agricultural Implements, Furniture, &c.

MISCELLANEOUS NOTES.

New Double and Single Barrel Guns.

The J. Stevens Arms & Tool Company, Chicopee Falls, Mass., have added to their line of double barrel guns No. 260, which will be the same as the company's No. 250, except with twist barrels, and taking a $27.50 list; also No. 270 with Damascus barrels, taking a $30 list. These, we are advised, will be ready for shipment in about a month. They have also added to their line of single barrel guns twist barrels, which they will be able to furnish, they state, in about 30 days, on any of their guns on special order, these taking the regular advance in price over blued barrels.

Box Straps.

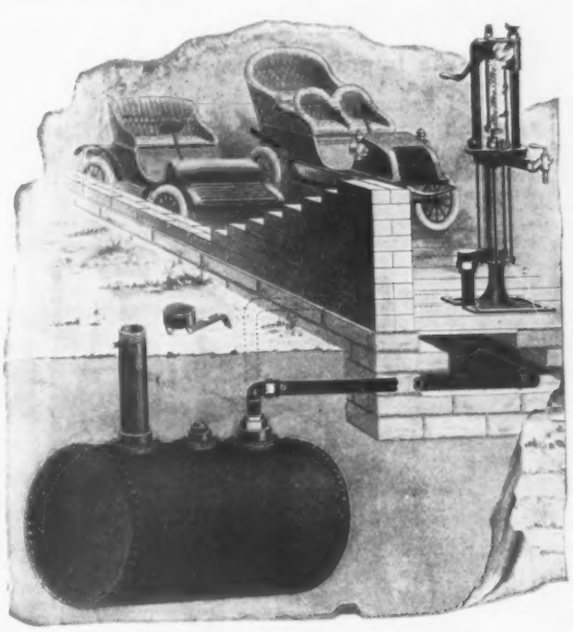
The Twisted Wire Box Strap Company, 451-453 Greenwich street, New York, have put on the market, in addition to their other straps of various kinds, corrugated steel box bands for strapping boxes. The bands are made in ⅝ and ⅞ inch widths, with a longitudinal corrugation on each edge. The bands are put up in bundles of 100 pairs, from 4 to 14 feet long, increasing by single feet to 12 feet. They also make a 5-16 inch width with a single center corrugation put up in the same way. This style of band can be had in bright or coppered surface, and they are smooth edged. They are also put up in coils of from 3000 to 5000 feet, and for such as require it can be supplied in 300-foot coils, one dozen in a case with an adjustable reel.

E. B. Estes & Sons.

E. B. Estes & Sons, wood workers, with offices at 45 and 47 John street, New York, have succeeded in producing wooden handles in imitation of hard rubber which are said to be so perfect that only experts can tell the difference between the rubber and the wood. They manufacture these handles in an endless number of sizes and variety of design, and the cost is referred to as 75 to 85 per cent. less than genuine rubber handles. This house have recently secured large tracts of land in Virginia where they are manufacturing a superior quality of axe, pick, hatchet and hammer handles at low prices.

Long Distance Gasoline Storage Outfit.

The accompanying cut illustrates an improved long distance gasoline storage outfit, offered by S. F. Bowser & Co., Fort Wayne, Ind. It is remarked that gasoline is



Long Distance Gasoline Storage Outfit.

very volatile and that it is imperative that upon receipt it be taken from the wooden barrels and stored in a perfectly air tight receptacle. The device shown in the illustration is designed for storing any amount of gasoline and to pump it where it may be required for use, in a safe, convenient and satisfactory manner, and in strict compliance with all insurance regulations. The makers state that the outfit is adapted to the use of manufacturers, merchants and automobilists.

Patent Nail Holder and Set.

The accompanying cut represents a nail holder and set put on the market by the L. S. Starrett Company, Athol, Mass., New York store, 123 Liberty street. The nail is placed under the spring in the lower end of the holder and is there retained by the pressure of the spring ready to be driven home. After one blow is struck the holder is withdrawn and the nail can be driven and sunk with the set. This is referred to as a great improvement over the difficult way of trying to hold a small nail between the thumb and finger at the risk of pounding them with the hammer. It is explained that the holder also admits of a nail being held to drive in places where the hand cannot go.

Patent Nail Holder and Set.

Straight and Bevel Edge Butt Chisels.

The L. & I. J. White Company, Buffalo, N. Y., are offering the cast steel butt chisels shown herewith. They are designed for the use of carpenters in fitting butts when hanging doors. They are 9 inches long over all, made in 12 widths from ⅛ to 2 inches inclusive, both in straight and bevel edge.

Straight and Bevel Edge Butt Chisels.

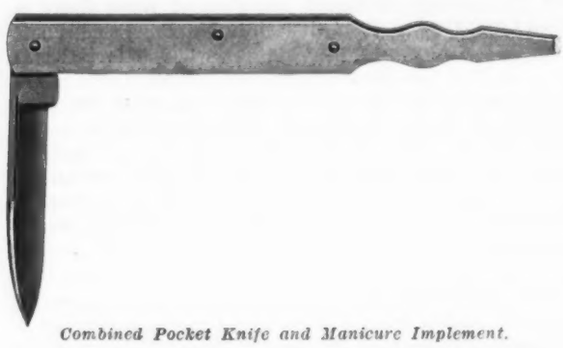
The Improved Royal Washer.

The washing machine illustrated herewith is referred to as washing by agitation, rubbing, suction and steam. The alternating long and short rubbing pins serve to agitate the wash thoroughly. The center piece, it is explained, besides increasing the rubbing surface makes the agitation more positive, as no wash can get in the dead center. It can be removed quickly for washing carpets, &c. The point is made that the machine washes perfectly clean and that no washboard is necessary. All force applied to the handle goes direct to the agitation of the wash. It is pointed out that as no cogs are used the machine is noiseless, that there is no lost motion and that friction is reduced to a minimum. The handle can be lowered or raised, shortened or lengthened and operated in a sitting or standing position. The tub is of white cedar, the sides and bottom being corrugated. The hoops, castings, bolts, screws and nails used in construction are galvanized. The machine is easy to handle even when set up, it is remarked, but if desired the legs can be removed by one blow of a hammer, and the lid, by means of a new hinge device, can be lifted off vertically, and with the agitator entirely removed only the plain tub is left to be handled. The machine is offered by the National Wringer & Mfg. Company, Canton, Ohio.

The Improved Royal Washer.

Combined Pocket Knife and Manicure Implement.

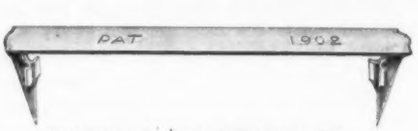
Schatt & Morgan Cutlery Company, Titusville, Pa., are offering the combined pocket knife and manicure implement shown herewith. It is referred to as combining a pen blade made of the best English steel, tempered by natural gas and fully guaranteed; a nail file, as shown on the back spring, and tweezers. The sides, or scales, of the handle are made of 18 per cent. spring German steel, handsomely polished, making a desirable article, it is remarked, for either the vest pocket of a gentleman or the toilet table of a lady. It may also be carried in a lady's pocket book. The goods are furnished one dozen on a card, or packed in bulk, as the buyer desires.



Combined Pocket Knife and Manicure Implement.

Mitchell's Improved Peerless Clasp.

The Twisted Wire Box Strap Company, 451-453 Greenwich street, New York, have recently put on the market Mitchell's improved Peerless clasp, as here shown. It is designed for fastening and sealing against pilfering pails, tubs, boxes, &c., of various articles such as confectionery, fruit and anything likely to tempt carriers in transportation. It is made of soft, coppered flat wire, in lengths from 1½ to 4½ inches inclusive, increasing by ½ inches. The novelty of this clasp is in the construction of the points, which can be driven into hard or soft woods without splitting, but not withdrawn without carrying portions of the wood with them, which the consignee can see at a glance before receipting for the shipment as though in good order. The clasps are light, pliable and strong and packed in boxes and kegs of 100 pounds, and barrels containing about 300 pounds.



Mitchell's Improved Peerless Clasp.

Warren's New Combination Cabinet.

The J. D. Warren Mfg. Company, Chicago, have recently added a new combination cabinet to their line of hardware store fixtures, which has been designed especially to meet the demands for an inexpensive cabinet for stores wherein it is desired to make a liberal display in a limited space. By use of the cabinet a small stock of hardware may be made to good advantage. In the new cabinet are combined some of

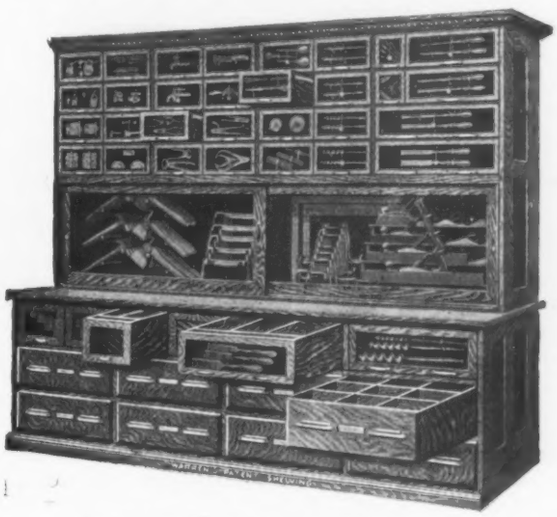


Fig. 1.—Warren's New Combination Cabinet.

the features of two other distinct styles heretofore manufactured, as shown in Fig. 1. The upper portion of the cabinet is provided with glass front drawers and the lower portion with sliding glass doors. Back of the doors are brackets, hooks, &c., for the display of samples. The upper portion of the cabinet is distinct from the base upon which it rests, and the two together make a desirable combination. The base has a depth of 30 inches from front to back, and is provided with drawers of ample length to accommodate long goods, such as augers, car bits, chisels, files, &c., the drawers being 24 inches in length from front to back, inside measurement. The matched backing and paneled ends of the sliding glass door display case section are lined with a thick chemically prepared paper to prevent dampness, and being of rich, all wool red felt, enhancing the appearance of the samples, which are attractively arranged on ebonized brackets fastened in place at the factory to

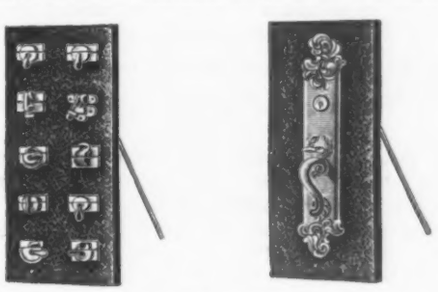


Fig. 2.—Portable Sample Boards.

suit any line of goods to be displayed, such as hammers, hatchets, braces, draw knives, planes, saws, steel squares, plumbs and levels, guns, revolvers, sporting goods, implements, caps, primers, cartridges, shells, &c. Within this same space is a new cabinet arrangement for builders' hardware on sample boards, shown in Fig. 2, of suitable size for store door handles and locks, or for the complete parts of a design of house trimmings, assembling the various sizes of front, inside and sliding door escutcheons, electric push button, sash fastener and lift on one sample board. Sample boards suited to other lines are made also, embracing shelf goods, as well as shears, scissors, razors, carvers, plated ware, &c.; back of the sample boards is space for the stock. The sample boards are made of various kinds of wood or covered with felt, as is best suited to the sample goods displayed. The samples can be easily reached by sliding back the glass door and placed on the ledge shelf or counter for inspection, as the sample board is supported with a wire bracket at an oblique angle. Those designed for cutlery permit of a liberal number of samples being shown instantly, and are held in place by hooks or clasps for convenient inspection in selling. The customer thus has placed before him a large variety to select from, and as quickly as a single design can be shown when carried in the ordinary way.

Electric Lamp Tray.

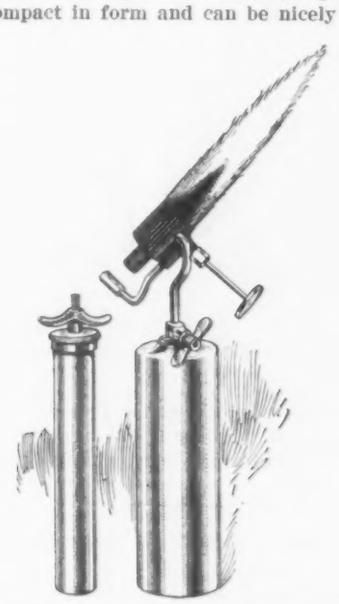
The W. J. Clark Company, Salem, Ohio, have recently put on the market the electric lamp tray shown here-

Electric Lamp Tray.

with. It is designed for handling incandescent electric lamps during the manufacturing process. The upper projection of the corner posts holds the feet in place when the trays are stacked upon each other. It is remarked that stacks or single trays slide easily upon the floor because the feet are broad and flat. The metal trays, it is pointed out, do not increase the fire risk, while they are said to be cheaper in the end than wooden trays.

The Turner Gasoline Auto Hand Torch.

The accompanying cut represents an auto hand torch manufactured by the Turner Brass Works, 48 North Franklin street, Chicago. It is a small gasoline torch which is compact in form and can be nicely included in



The Turner Gasoline Auto Hand Torch.

the tool equipment. The illustration gives an accurate idea of its shape and construction. It weighs 1 pound and the reservoir, which measures 1¾ x 5 inches, holds ½ pint, enough for one hour's continuous burning. The air pump is separate from the torch proper. The flame is referred to as clean and very hot, and it can be regulated to any length up to 6 inches. It has a large variety of uses and is a valuable addition to the tool outfit of an automobilist.

The Steel Loose Joint Spring Hinge.

The Cleveland Lock Company, Cleveland, Ohio, are offering the loose joint steel spring hinge shown in the accompanying cuts. The hinge is of the hold back variety and the working parts are attached to the door, as shown in Fig. 2. The hinge is either right or left, the change being made by putting the pin half on the door with the crank pointing in and the nib on the washer pointing out. Should it not be desired to lift the door off the hinges one hinge is turned upside down, when they act like ordinary hold back hinges. The point is made that no step ladder, screw driver or other tools are necessary when the door is put in place or removed, after the hinges have once been attached. The hinges are finished in japan.

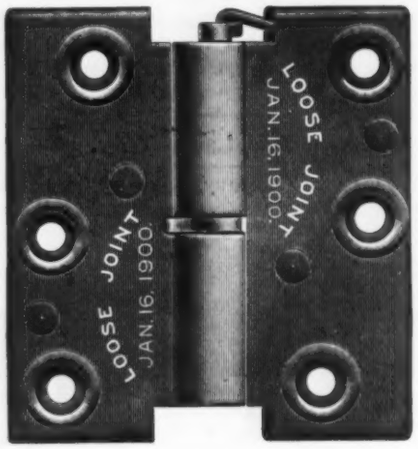


Fig. 1.—The Steel Loose Joint Spring Hinge.

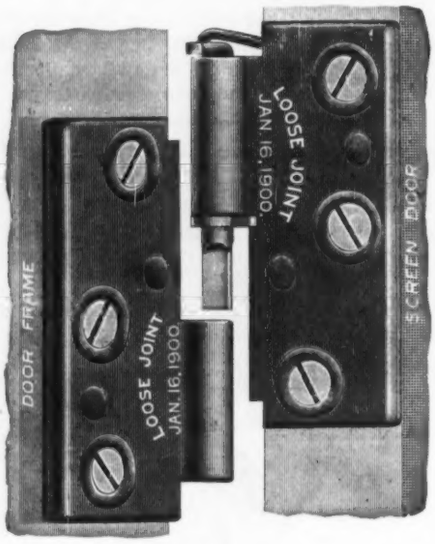


Fig. 2.—As the Hinge Appears Lifted Off.

Improved Angle Rail Door Hanger.

The accompanying cuts illustrate the Bischoff door hanger, the peculiar advantage of which, it is stated, is that there is nothing to clog with dirt, and that snow, sleet or ice have no opportunity to settle on the sharp cornered track. One of the features of the hanger is the retaining guard roller underneath the angle, to prevent the derailment and to make the door roll when bottom pressure is put on. In Fig. 2 is shown the manner in which the door may be swung outward to suit all purposes. The hangers and supports are made of malleable iron, the track of highly carbonized angle steel, 1¼ x 1¼ inches, and ⅛ inch thick. It is explained that the hangers are tested and guaranteed to carry 2200 pounds, and that they are adapted for use on car, barn and elevator doors, and especially on iron doors.

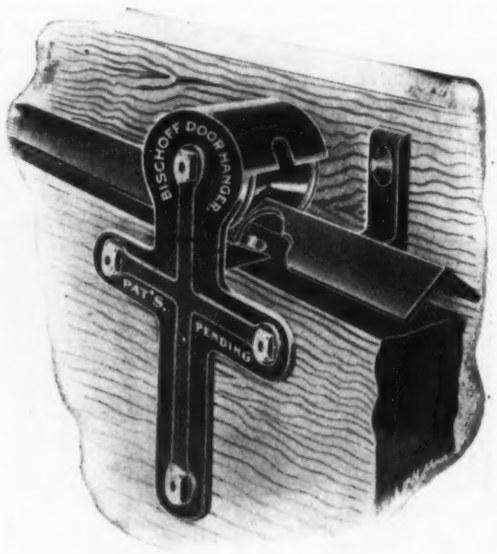


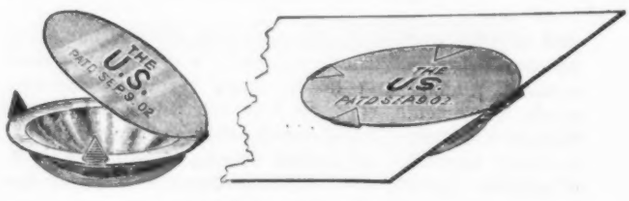
Fig. 1.—Improved Angle Rail Door Hanger.

Fig. 2.—Door Swung Outward.

The hanger is offered by Fred. F. Bischoff & Co., Grand avenue and Robey street, Chicago, Ill.

The U. S. Mailing Receptacle.

The accompanying cuts represent a mailing receptacle for safely sending small articles by mail. It is stamped from one piece of tin plate and fastens over the edge of a mailing card, business card, letter or tag, as shown in the cut to the right. It will carry ¾ ounce, with writing on card for 2 cents, or without writing for 1 cent. The receptacle can be used for sending coins, or samples of tacks, rivets, small washers, springs, paint, &c. The goods are packed 100 in a box. Mailing cards will be provided if desired. The device is offered by the J. T. Buel Company, Whitehall, N. Y.



The U. S. Mailing Receptacle.

Current Hardware Prices.

REVISED JUNE 2, 1903.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued April, 1902, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

Adamite in Carloads:
Crystal ₱ ton $90@100
Grain ₱ ton $120@140
See also *Emery*.

Adjusters, Blind—

Domestic, ₱ doz. $3.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent 25&5%
Tapiin's Perfection 25&5%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Armand Hammer, Wrought ₱ ₪ 8½@8¾¢
Buel Patent Trenton ₱ ₪ 9½@9¾¢
Eagle Anvils ₱ ₪ 7¼@7¾¢
Hay-Budden, Wrought 9@9½¢
Horseshoe brand, Wrought 9@9½¢

Imported—

Peter Wright & Sons ₱ ₪ 10½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00 50&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz. 25%
Smaller Lots. 20%
Lots of 3 doz. 30%

Augers and Bits—

Com. Double Spur 70@70&10
Boring Machine Augers 66⅔@70%
Car Bits, 12-in. twist 60@60&10%
Jennings' Pattern Auger Bits 50&10&5@60%
Ford's Auger and Car Bits 40%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jennings' List. 40&7½&10%
Russell Jennings' 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayhew's Countersink Bits 45%
Millers' Falls 50&10&7½%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $15; large, $26 50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18 50&10%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's 60%

Gimlet Bits—

Common Double Cut..gro. $2.50@3.00
German Pattern.....gro. $4.00@4.25

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames 25&10%
New Patent 25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.00
Unhandled, Shouldered. gro. 63@66c
Unhandled, Patent.....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. 51@54c
Unhandled, Shouldered. gro. 67@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, factory brands...$6.00
First Quality, jobbers' brands...$5.50
Second Quality.....$5.00@5.25

Axle Grease—See *Grease, Axle.*

Axles—

Iron or Steel

Concord, Loose Collar.... 4½@5c
Concord, Solid Collar....4½@4¾c
No. 1 Common.....3¾@4 c
No. 1 Com. New Style..3¾@4 c
No. 2. Solid Collar.....4¼@4½c
Nos. 11 to 14 .....60&10&10@70%
Nos. 15 to 18..... %
Nos. 19 to 22.....70&10&5%

2% cash 10 days.

Boxes, Axle—

Common and Concord, not turned.. 15, 4¼@4½c
Common and Concord, turned..... lb. 5@5¼c
Half Patent.....lb. 9@9½c

Balances— Sash—

Caldwell new list 50¢
Pullman's 60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Sus. Balances. 40&10%
Straight Balances. 40%
Circular Balances 50%
Large Dial 30%
Pelouze 50%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb., per lb.. 3@3¼c

Towel—

No. 10 Ideal, Nickel Plate.....₱ gro, $8.50
No. 20 Ideal, Brass Finish.....₱ gro $8.50

Baskets—

Hoffman's Brick Baskets. .....each $3.25

Beams, Scale—

Scale Beams, List Jan. 12, '98..40@40&10%
Chatillon's No. 1 30%
Chatillon's No. 2 40%

Beaters— Egg—

Lightning Chain, ₱ doz, $1.15; ₱ gro.... $12.00
National Mfg. Co.: ₱ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size 14.00
Taplin Mfg. Co.: ₱ gro.
No. 60 Improved Dover $6.50
No. 75 Improved Dover $7.50
No. 75-2 Imp'd Dover, Tin'd $9.00
No. 100 improved Dover $8.00
No. 102 Improved Dover, Tin'd $9.50
No. 150 Improved Dover, Hotel $15.00
No. 152 Imp'd Dover, Hotel, T'd $17.00
No. 200 Imp'd Dover Tumbler $9.00
No. 202 Imp'd Dover Tumbler, Tin'd $10.00
No. 300, Imp'd Dover Mammoth, ₱ doz $27.00
Wonder (S. S. & Co.) ₱ gro. $6.00

Bellows—

Blacksmith, Standard List. 70@70&10%

Blacksmiths'—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:

Each	*$4.00*	*4.55*	*5.10*	*5.60*	*6.40*	*7.50*

Net Prices.

Molders—

Inch.....	*9*	*10*	*11*	*12*	*13*
Doz.....	*$8.00*	*9.50*	*10.90*	*12.80*	*14.25*

Hand—

Inch.....	*6*	*7*	*8*	*9*	*10*
Doz.....	*$6.75*	*5.70*	*6.80*	*7.60*	*8.50*

Bells— Cow—

Ordinary goods.....75&5@75&10%
High grade.....70@70&10%
Jersey 75&10%
Texas Star 50%

Door—

Abbe's Gong 45%
Barton Gong 55%
Home, R. & E. Mfg. Co.'s 55&10%
Lever and Pull, Sargent's 60&10&10%
Yankee Gong 55%

Hand—

Hand Bells, Polished....60&5@60@1%
White Metal .....55@55&10%
Nickel Plated.....50@50&5%
Swiss .....60@60@1½%
Cone's Globe Hand Bells. ₱ ₪ 33⅓&10%
Silver Chime 33⅓@33⅓&10%

Miscellaneous—

Farm Bells..... lb. 2@2¼c
Steel Alloy Church and School.....60%
American Tube & Stamp'g Co. Gongs. 70%
Trip Gong Bells 55&10@60%

Belting— Rubber—

Agricultural (Low Grade). 75&10@80%
Common Standard.....75@75&10%
Standard.....70@70&10%
Extra..... .60&10&5%
High Grade..... 50&10@50&10&5%
Boston Belting Co.:
Seamless Stitched Imperial..... 45&5%
Boston 50&5%
Niagara 60&5%

Leather—

Extra Heavy, Short Lap....60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard .....70@70&5%
Light Standard.....70&10%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft..18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender. 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25. No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....70&10@75%
Hollow Steel Blocks, with Ford's Patent Sheaves 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron.....50&10%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c.....30&10@40%

Bolts—

Carriage, Machine &c.—

Common, list Feb 1, '02..... 60&10@60&10&10%
Norway Iron. $3.00, list Jan. 1, '98 80@80&5%
Phila. Eagle, $3.00 list May 24, '98.... 80@80&5%
Bolt Ends, list Feb. 14, '95...65&5@..%
Machine, list Oct. 1, '99..... 65@..%
Machine with C & T. Nuts..... 60@2½@..%

NOTE.—*Jobbers are in many cases underselling the manufacturers.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.57*	*.80*	*1.00*

Wrought Barrel Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.44*	*.50*	*.61*	*.70*	*1.38*

Wrought Barrel...75&10@75&10@10%
Wrought " Bronzed. 50@50@50@10%
Wrought Flush, B. K..50@10@60@10%
Wrought Shutter...40@10@10@50@5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50@10%
Ives' Patent Door 60%

Stove and Plow—

Plow .....60@..%
Stove.....80@80@10%

Tire—

Common.....72½@72½@10%
Norway Iron.....50@30@5%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82½%
Bay State, list Dec. 28, '99.....72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84.....82½%
Eclipse, list Dec. 28, '99.....72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99.....72½%
Norway Phila., list Oct. '84.....80%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1⅜*	*1½*	*2*
Per doz..	*$4.30*	*5.00*	*5.75*	*7.25*
Inch	*2¼*	*2½*		
Per Doz.....	*$8.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25&10%
Langdon 15&10%
Schatz 40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American...$1.15@1.25
Barber's 50&10&10@60&10%
Fray's Genuine Spofford s 60%
Fray's No. 70 to 120, 81 to 143, 207 to 414 60%
C. E. Jennings & Co. 50&5&10%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Patent. 50%
Millers Falls Drill Braces 25&10%
P., S. & W. Co. Peck's Patent 60&10@65%

Brackets—

Wrought Steel.....75&10@80%
Bradley's Wire Shelf:
Full cases 80&10&10%
Broken cases 80&10%
Griffin's Pressed Steel 80%
Griffin's Folding Brackets. 70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co. 75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks Saw—

Hoosier ₱ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—

Wrought list Sept., '96.....30@30&5%
Cast Brass, Tiebout's 50%

Cast Iron—

Fast Joint, Broad.....50@50&10%
Fast Joint, Narrow.....50@50&10%
Loose Joint.....70@50@70&10%
Loose Pin.....70@50@70&10%
Mayer's Hinges.....70@50@70&10%
Parliament Butts.....70@50@70&10%

Wrought Steel—

Table and Back Flaps.....75%
Narrow and Broad.....75%
Inside Blind.....75&10%
Loose Pin.....75&10%
Loose Pin, Ball and Steeple Tip 67½&5%
Japanned, Ball Tip Butts. 70&10%
Bronzed Wrt. Nar. and Inside Blind Butts.....55&10%

Extra 10@10&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series 40&10%
Hendryx Bronze:
700, 800 series 40&10%
Hendryx Enameled 40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4@4¼c
Sharp, 1 prong.....per lb. 4½@4¾c
Perkins' Blunt Toe ₱ ₪ 3½¢
Perkins' Sharp Toe ₱ ₪ 4 ¢

Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons.....per doz. $2.00

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore P.tt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	120.00 gro

Caps—Percussion—

Eley's E. B......69c
G. D.....*per M 32@34c*
F. L.....*per M 42@...c*
G. E.....*per M 47@50c*
Musket.....*per M 62@...c*

Primers—

Berdan Primers, $1.60 per M.....5%
B. L Caps (Sturtevant Shells) $1.00 per M.....5%
All other primers per M. $1.22@$1.27

Cartridges—

Blank Cartridges:
32 C. F., $5 50.....10&5%
38 C. F., $7 00.....10&5%
22 cal. Rim, $1 50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con., Ball Swgd.....*$1.90*
B. B. Caps, Round Ball.....*$1.40*
Central Fire.....25%
Target and Sporting Rifle.....15&5%
Primed Shells and Bullets.....15&10%
Rim Fire Sporting.....50%
Rim Fire, Military.....15&5%

Cases, Show—

Sun, No. 103, Silent Salesman, 6 ft., $25.00

Casters—

Bed.....70@70&10%
Plate.....60@60&5%
Philadelphia.....75@75&10%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3/16	*1/4*	*5-16*	*3/8*	*7-16*	*1/2*	*9-16*
8.50	*6.00*	*4.90*	*4.00*	*3.80*	*3.70*	*3.65*
5/8	*3/4*	*7/8*	*1 to 1¼ inch.*			
3.60	*3.55*	*3.50*	*3.40*	*per 100 lb.*		

German Coil.....60&10@10%

Halters and Ties—

Halter Chains.....60@10&60@10@10%
German Halter Chains, list July 24, '97.....60@10&10@70@1%
Cow Ties.....70@1@60%

Trace, Wagon, &c.—

Traces, Western Standard; 100 pair
6½—6-3, Straight, with ring...$27.00
6½—6-2, Straight, with ring...$28.00
6½—8-2, Straight, with ring...$33.00
6½—10-2, Straight, with ring...$37.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains...60@60@10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60@10@60@10@10%
Brass.....60@10@60@10@10%
Safety Chain.....70&10@75@5%
Gal. Pump Chain.....*lb. 4¼@4½c*
Covert Mfg. Co.
Breast.....40&2%
Halter.....40&2%
Heel.....40&2%
Rein.....40&2%
Stallion.....40&2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@45&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter.....45@50&5%
Niagara Coil and Halters.....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Wire Dog Chains.....45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....*gro. 40@45c*
Carpenters', Red.....*gro. 35@40c*
Carpenters', White.....*gro. 30@35c*
See also Crayons.

Checks, Door—

Bardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc, Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....70@7 0&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70%
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers.....40@5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181.....16⅔&10%
L. & I. J. White, Tanged.....35&5%

Cold—

Cold Chisels, good quality, lb. 13@15c
Cold Chisels, fair quality...lb. 11@12c
Cold Chisels, ordinary.....*lb. 8@9c*

Chucks—

Beach Pat., each $8.00.....5&5%
Pratt's Positive Drive.....25%
Empire.....25%
Blacksmiths'.....25%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard.....30%
Drill Chucks, New Model.....25%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....25%
Universal Lathe Chucks.....40%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Case Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%
Wescott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....40%
Little Giant Double Grip Drill.....40%
Little Giant Drill, Improved.....40%
Oneida Drill.....40%
Scroll Combination Lathe.....40%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....50%
Carriage Makers' Sargent's.....60%
Beaty, Parallel.....33⅓&10%
Linemans, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel.....₱ doz. $4.05 net
Star Shank, All Steel.....₱ doz. $3.24 net
W. & C. Snank, All steel, 7½ in. ₱ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@33⅓&10%
P., S. & W.....50@50&5%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company

'93 Chicago Horse	$8.75
1902 Chicago Horse	$10.75
Lightning Belt	$15.00
Chicago Belt	$20.00

15%

Stewart's Patent Sheep.....$18.50

Clips Axle—

Eagle and Superior ¼ and 5-16 inch.....70@10%
Norway, ¼ and 5-16 inch...70@70@10%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs.....65@5@65@10%
Globe, Kerosene, Racking, &c., Cocks.....65@10@70%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—

Brass, Walter B. Stevens & Son's list.40%
Embossed, Gilt, Walter B. Stevens & Son's list.....30&10%
Leather, Walter B. Stevens & Son's list.40%

Combs Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses Dividers, &c.

Ordinary Goods.....75@75@5%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....35&10%

Compressors Corn Shock—

J. B. Hughes' ₱ doz.....$2.50

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested*	*Not nested.*
Eastern....	*7@12½%*	*7@7½%*
Central....	*7@7½%*	*7%*
Southern...	*65@10%*	*65@5%*
S. Western..	*65@7½%*	*65@2½%*

Terms, 2% for cash. With delivery on rail cr.ates.

See also *Eave Troughs.*

Coolers, Water—

Gal. each.	2	3	4	6	8	
Labrador	$1.20	$1.50	$1.80	$2.10	2.70	
Gal.	3	4	6	8		
Iceland, ea.	$1.80	$2.10	$2.40	$3.00		
Gal....	2	3	4	6	8	
Galv. Lined Ea.	$1.85	$2.00	$2.25	$2.90	$3.90	25%

Galv. Lined side handles

Gal.	3	3	4	6	3	
Each.	$1.95	$2.15	$2.40	$3.3)	$4.15	25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....*lb. 25c*
Braided, White, Com.... *lb. 17½@18c*
Cable Laid Italian...*lb. A, 18c; B, 16c*
Common India.....*lb 9 @9½c*
Cotton Sash Cord, Twisted...*12@16c*
Patent Russia.....*lb. 12½@13c*
Cable Laid Russia.....*lb. 13½@14c*
India Hemp Braided.....*lb 14@15c*
India Hemp, Twisted.....*lb. 10@12c*
Patent India, Twisted.....*lb.10@12c*
Anniston Cordage Co.:
Old Glory, Nos. 7 to 12.....₱ lb 24 ¢
Anniston, Nos. 7 to 12.....₱ lb 19 ¢
Old Colony, Nos. 7 to 12.....₱ lb 18½¢
Anniston Drab, Nos. 7 to 12.....₱ lb 24 ¢
Pearl Braided, cotton.....₱ lb 17½¢
Massachusetts, White.....₱ lb 22½¢
Massachusetts, Drab.....₱ lb 26½¢
Eddystone Braided Cotton.....₱ lb 19¢
Harmony Cable Laid Italian.....₱ lb 18¢
Osgawan Mills:
Crown, Solid Braided White...₱ lb 22¢
Braided, Giant, White.....₱ lb 20¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton.....₱ lb 32½¢
Braided, Italian Hemp.....₱ lb 32½¢
Braided, Linen.....₱ lb 40¢
Braided, White Cotton, Spot.₱ lb 28½¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....15%

Wire, Picture—

List Oct., '00.....85@10@85@10@5%

Crackers, Nut—

Little Giant,.....₱ gr. $24.00

Cradles—

Grain.....50%

Crayons—

White Round Crayons, gross, 5½@6c
Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.

Metal Workers' Crayons, gr.	$2.50
Soapstone Pencils, round, flat or square	gr. $1.50
Rolling Mill Crayons	gr. $2.50
Railroad Crayons (composition)	gr. $2.00

Case lots 20%

See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2 50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $3.00
No. 77 Medium Knives.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

Hale's., Nos. 11 & 111 12 & 112 13 & 113
Per doz .. $8.00 10.75 14.50
American.....30%
Nos..... 1 2 3 4 B 5
Each.....$5 $7 $10 $25 $50 $60
Enterprise.....25@25&7½%
Nos..... 5 10 12 22 32
Each..... $2 $3 $2.75 $4.50 $6
Dixon's, ₱ doz.....30&10@40%
Nos..... 1 4
$14.00 $17.00 $19.00 $30.00
Home No. 1, ₱ doz. $22.75.....50&10%
Little Giant, ₱ doz.....33⅓&5@40%
Nos. 305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
N. E. Food Choppers.....40%
Sterling.....40@40&1 %
No. 1 ...$2.00 each No. 2 ..$2.50 each
New Triumph No. 605, ₱ doz. $24.00...30&10@40%
Woodruff's, ₱ doz.....30&10@40%
Nos..... 100 150
$15.00 $18.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Sterling, $6.00 each.....33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr....$22@$30

Tobacco—

All Iron, Cheap.....*doz. $4.25@$4.50*
Enterprise.....25&5%
National, ₱ doz. No. 1, $21; No. 2, $18..40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's No 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz. $16.00.....50&10%
Bonney's.....40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₱ doz.....$6.75
Iwan's Perfection Post Hole Digger, ₱ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ₱ doz.....$7.50
Kohler's Universal.....₱ doz, $15.00
Kohler's Little Giant.....₱ doz. $12.60
Kohler's Hercules.....₱ doz. $10 00
Kohler's Invincible.....₱ doz. $9 60
Kohler's Rival.....₱ doz. $8.50
Kohler's Pioneer.....₱ doz. $7.50
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ¾ in.....₱ doz, $10.50
Phillips', style 077, ¾ in.....₱ doz, $8.00
Phillips', style x-y, ¾ in.....₱ doz, $11.00
Porter's Plain, No. 6.....per doz, $6 75
Porter's Ornamental, No. 70. ₱ doz. $19.50
Porter's No. 99.....$9.00
Porter's No. 44.....$10.75

Drawers, Money—

Sun Money Drawers, No. 5, ₱ doz. $9.50; No. 6, with Bell, $10.00; No. 6, with Gong, $10.50.
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill...each $1.50@$1.75
Blacksmiths' Self-feeding, $3.75@4.00
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40&5%
Goodell Automatic Drills..40&5@40&10%
J. Russell's Automatic Drills Nos. 2 and 3.....16⅔&10%
Johnson's Drill Points.....16⅔&5&10%
Millers Falls Automatic Drills...33⅓&10%
Ratchet, Curtis & Curt's.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P. S. & W.....50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10@60&10&10%
Taper and Straight Shank.....60&10@60&10&5%

Drivers Screw—

Screw Driver Bits...per doz. ..45@75c
Baisey's Screw Holder and Driver, ₱ doz. 2-in. $6; 4-in., $7.50 6-in., $9...40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet.....25%
Goodell's Auto 50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 2, and 21.....25&10%
Millers Falls, Nos. 11, 12, 41, 42.....15&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60.....60%
Nos. 20 and 40.....70%
Smith & Hemenway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 30@30&10&10%
No. 86.....70@70&10&10%
Swan's:
Nos. 6⅔ to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory. L. C. L.
Eastern.....75@12½%
Central.....75@12½%
Southern.....75@2½%
S. Western.....75%
Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments.....60%
Perfect Elbows (S. S. & Co.).....30%

Emery, Turkish—

	4 to 46	5 to 150	Flour
Kegs..... *lb.*	*5c*	*5½c*	*3¼c*
½ Kegs..... *lb.*	*5¼c*	*5¾c*	*3¼c*
Kegs..... *lb*	*5c*	*6c*	
10-lb cans, 10 in case	*6½c*	*7c*	*6c*
10-lb. cans, less than 10	*10c*	*10c*	*8c*

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Wallin's.....50%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined.....70@70&10%
Red Cedar.....40@10@50%
Petroleum.....70@5@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key.....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's No Brand, Cedar.....50%
John Sommer's Perfection Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ½ and ⅝ inch.....35%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.
Best Brands.....70@5@70@10@5%
Standard Brands..75@5@75@10@10%
Second Quality.....5@10@10@80@5%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....30%

Fixtures, Grindstone—

Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.60*	*2.75*	*3.00*	*3 50*	*4.50*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....60&10&10%
Stowell's Giant Grindstone Hanger.... ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures Light.... 60&10%

Fodder Squeezers—

See *Compressors.*

Forks—*Aug. 1, 1899, list.*

Hay, 2 tine.....62½
Hay 3 tine.....60@62½
Hay, 4 tine.....60@62½
Hay, Header and Baler 3 tine 60@65
Hay, Header and Baler, 4 tine 60½
Grain or Barley.....70
Manure, 4 tine.....60@20
Manure, 5 and 6 tine.....60@20
Spading.....70@5
Extra 5%

Iowa Digg-zy Potato.....65%
Victor, Hay.....60@5%
Victor, Manure.....60%
Victor, Header.....60@5%
Champion, Hay.....60@5%
Champion, Manure.....60@20%
Columbia, Hay.....60@5%
Columbia, Manure.....70%
Columbia, Spading.....70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....65%
Acme Hay.....60&10&7½%
Acme Manure, 4 tine.....60&20&10%
Acme Manure, 6 tine.....63½&10&2%
Dakota Header.....65&15&5%
Jackson Steel Barley.....55&15&5%
Kansas Header.....6½%
W. & C. Favorite Wood Parley 4 tine, ₱ doz., $5.40; 6 tine, $6.30
Plated. -See *Spoons*.

Frames— Saw—

Red, Polished and Varnished...doz. $1.15@$1.35
White.....*doz. 75@80*

Freezers Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best	$1.45	1.65	1.95	2.40	3.20	4.2
Good	$1.25	1.40	1.70	2.15	2.75	3.7
Fair	$1.00	1.10	1.30	1.75	2.30	2.9

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly*.

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Vesuvius Fuse.....$2.60
Cotton Fuse.....2.90
Single Taped Fuse.....3.25
Double Taped Fuse.....4.20
Triple Taped Fuse.....5.00
10@25%

Gates, Molasses and Oil—

Stebbins' Pattern.....80@80&10%

Gauges—

Marking, Mortise, &c......50&10@5/&10&10%

Chapin-Stephens Co.:
Marking, Mortise, etc.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Fulton's Butt Gauge.....30&10%
Stanley R. & L. Co.'s Butt & Rabbet Gauge.....20@20&10&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P., S. & W. Co.....30&10%

Gimlets— Single Cut—

Nail, Metal, Assorted, gro. $1.40@1.60
Spike, Metal, Assorted gro. $2.80@3.25
Nail, Wood Handled, Assorted. gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $3.25@3.50

Glass, American Window

Jobbers' List, Dec. 16, 1902
From store. Single and Double 90&10%
F. O. B. factory, carload lots Single and Double.....90&20&2½%
2000 box lots.....90&25%

Glasses, Level

Chapin-Stephens Co.....60@60&10&10&12½%

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (½ pts., pts., qts).....33⅓@58%
List C, Cans (½ gal., gal.).....25@45%
International Glue Co. (Martin's).....40&10@5%

Grease, Axle—

Common Grade.....*gro. $5.00@6.00*
Dixon's Everlasting....10-lb pails, ea. 80¢
Dixon's Everlasting, in bxs., ₱ doz. 1 lb. $1.20; 2 lb $2.00

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz.....$2.00
Pike Mowe Knife and Tool Grinder, each.....$1.00
33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames.....each, $3.25

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000.....$9.00
Copper ₱ 1000.....$18.00

Halters and Ties—

Covert Mfg. Co.:
Web.....15&2%
Jute Rope.....40&5&2%
Sisal Rope.....20&5%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Halters.....70%
Sisal Rope Ties.....60&10%

Hammers—

Handled Hammers—

Heller's Machinists'..40&10&4&2½&10%
Heller's Farriers'....40&10&40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40@40&2½&10%
Peck, Stow & Wilcox.....50%
Fayette R. Plumb:
Plumb, A. E. Nail..33⅓&7½@33⅓&21 &7½%
Engineers' and B. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers 50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

8 lb. and under...lb. 4½c } 75&5@75
8 to 5 lb.....lb. 5½c } @70%
Over 5 lb.....lb. 5½c
Wilkinson's Smiths'.....*9½c@10c lb.*

Handles—

Agricultural Tool Handles—

Axe, Pick, &c......*4c@50&5%*
Hoe, Rake, &c......*60@60&5%*
Fork, Shovel, Spade, &c.:
Long Handles.....*60%*
D Handles.....*50%*

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted.....*gro. $2.30@$2.50*
Brad Awl.....*gro. $1.35@$1.50*
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.35@$2.35; large, $2.50@$2.50.
Hickory Tanged Firmer, gro. ass'd. $1.75@$2.20; large, $3.50@$3.70.
Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.60@$2.25
Hickory Socket Firmer, gro ass'd, $1.60@$1.75; large, $1.75@$2.00
Hickory Socket Framing, gro, ass'd. $2.50@$2.75; large, $2.65@$2.85
File, assorted.....*gro. $1.60@$1.15*
Hammer, Hatchet, Axe, &c......*50%*
Hand Saw, Varnished, doz. 70@75c
Not Varnished.....*55@60c*
Plane Handles:
Jack, doz. 25c; Jack Bolted. .55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c

Chapin-Stephens Co.:
Carving Tool.....40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Miners Fans Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle, ₱ gro.....$0.85@$1.50

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch.....	*3*	*4*	*5*	*6*	*8*
Single Doz.	$0.85	1.20	1.50	1.90	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch.....	*3*	*4*	*5*	*6*
Single Doz.	$1.10	1.60	2.15	2.70

Alith Mfg. Co.
Reliable.....per doz. $15.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.15
Parlor, Standard.....$3.35
Parlor, New Model.....$2.85
Parlor New Champion.....$2.25
Barn Door, Standard.50&10&5%
Covered.....50&10&10%
Special.....50&10&10&5%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
Giant.....50&10%
New York.....60%
Peerless.....60&10%
Sterling.....60%
Swing, No. 95.....50&10%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.50&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door.....50&10%
Monarch Barn Door.....60&10%
Never Jump Hinge.....50&10%
Peerless.....60&10%
Perfection.....70&5%
Phoenix.....70&5%
Wagner's Adjustable.....70&10%
Warehouse Anti-Friction.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3.....$2.25
Imp'd Wood Track No. 5.....$2.25
Imp'd Steel Track No. 7.....$2.70
Imp'd Steel Track No. 7.....$2.65
Ball B'r'g steel Track No. 9.....$2.50
Ball B'r'g Steel Track No. 10.....$2.50
Roller B'r'g Steel Track No. 11...$2.45
Roller B'r'g Steel Track No. 12...$2.40
Ball B'r'g Steel Track No. 13...$2.75
Roller B'r'g Steel Track No. 14...$2.65
Ball B'r'g Trolley Track No. 15...40%
Ball Brg Trolley Track No. 19...40&5%
Ball Bearing Tandem Trolley Track No. 16.....40%
Silent Adjustable Track No. 18...40%
Auto-Adjustable Track No. 22...40%
Trolley B. D. No. 17.....$1.60
Trolley F. D. No. 121.....$2.70
Trolley F. D. No. 131.....$2.85
Trolley F. D. No. 151.....$3.00
Roller Bearing D. D. No. 25.....70&5
Roller Bearing U. S. B. D.....70&5%
Anti Friction B. D.....60&10%
Ives' Wood Track No. 1.....$2.15
Ives' Imp'd Wood Track No. 2...$2.15
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing.....40%
Atlas.....60%
Badger Barn Door.....50%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator.....40%
Express.....50%
Interstate.....60%
Lundy Parlor Door.....50%
Magic.....50%
Matchless.....60%
Nansen.....60&10%
Railroad.....50%
Street Car Door.....50%
Steel, Nos. 300, 401, 500.....40&15%
Stowell Parlor Door.....50%
Wild West, Nos. 300, 401, 500.....50%
Zenith for Wood Track.....30%
A. A. Sweet Iron Works:
Eagle.....50&10%
Hub.....50&10%
Perfection.....60%
Pilot.....50%
Taylor & Boggis Fy Co.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing.....40%
Velvet.....50%
Wilcox Auditorium Ball Bearing.50%
Wilcox Barn Trolley No. 121.....40%
Wilcox Elv. Door, Nos 112 and 122.50%
Wilcox Elv. Door, No. 132.....40%
Wilcox Fire Trolley, Roller Bearing.....70%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox O. K. Steel Track.....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing.....40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%
For Track, see *Rail*.

Extra 5@10% often given.

Hangers, Gate—

Myers' Patent Gate Hangers, ₱ doz., net, $4.50

Hasps—

McKinney's Perfect Hasp ₱ doz.....50%

Hatchets—

Best Brands.....*50@50&10%*
Cheaper Brands.....*60@60&10%*
Note.—Net prices often made.

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1888 O. P. Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.....	*1*	*3*	*5*
Doz. pair.....	$0.85	1.75	3.50

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.....	*1*	*1½*	*2*	*2½*
Doz. pair.....	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.....	*1*	*1½*	*2*
Doz. pair.....	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70@75%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13.....70&10@70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $9.80 with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter.....7 &5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Stenger's Positive Locking, Nos. 1 & 3.....70&10%
Shepard's Noiseless, Nos. 60, 65, 55...70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75%
1888, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pat'n, Nos. 1, 3& 5.....75%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75..75%
Steamboat Gravity Locking, No. 10..75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Extra 5@10% often given.

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.....	*1*	*2*	*3*
Hinges with Latches.	$3.00	3.70	5.00
Hinges only.....	$1.10	2.05	3.80
Latches only.....	.70	.70	.35

New England:

With Latch.....doz.	*....@*	$2.70
Without Latch....doz.	*....@*	$1.80

Reversible Self-Closing:

With Latch.....doz.	*....@*	$1.80
Without Latch.....doz.	*....@*	$1.45

Western:

With Latch.....doz.		$1.80
Without Latch.....doz.		$1.20

Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Spring Hinges—

Holdback, Cast Iron, gro. $7.50@10.70
Non-Holdback, Cast Iron gro $7@7.50

J. Bardsley
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges 40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges.....50%
Chicago (Ball Bearing) Floor Hinge.....45%
Garden City Engine House...25%
Keene's saloon Door.....25%
Columbian Hdw. Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....20&5%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable, No. 7 ₱ gr. $12.00
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.50
Oxford, new list.....30%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable 50%
Lawson Mfg. Co.:
Marchless.....35%
Matchless Pivot.....45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge.....40%
Chief Ball Bearing Floor Hinge..45%
Royal Ball Bearing Floor Hinge..45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....45%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges.....80&7½%
Heavy Strap Hinges 80&20&10%
Light T Hinges.....75&10&5%
Heavy T Hinges.....75&5%
Extra Heavy T Hinges .8 &2½%
Hinge Hasps.....70%
Cor. Heavy Strap....80&20&10%
Cor Ex. Heavy T.....80&20%
Extra 10&5%

Screw Hook and Strap. { *6 to 12 in.....lb.* 3½c; *15 to 30 in.....lb.* 3¼c; *22 to 36 in.....lb.* 3 c

Screw Hook and Eye:
¾ to 1 inch.....*lb* 5 c
⅝-inch.....*lb* 6 c
½-inch.....*lb.* 7 c

Miscellaneous—

Hoffman's Steel Spring Butt Hinges.....40&10%
Hoffman's Offset Refrigerator Hinges.....40&10%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.....35%

Hods, Coal—

	15	*16*	*17*	*18 inch.*
Galv. Open..	$2.50	2.75	3.00	3.25 ₱ doz.
Jap. Open...	$2.00	2.25	2.50	2.75 ₱ doz.
Galv. Funnel.	$3.00	3.25	3.50	3.75 ₱ doz.
Jap. Funnel.	$2.50	2.75	3.00	3.25 ₱ doz.

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10
Hoffman's:
Brick.....each $1.10
Mason's.....each $2.00
Plasterers'.....each $3.20

Hoes— Eye—

Scovil and Oval Pattern.....60&10@60&10&10%
Grub, list Feb. 23, 1899....70@70&10%

Handled—

Aug. 1, 1899, List:
Garden.....70&10%
*Meadow & Rhode Island*75&2½%
Southern Meadow...75&5&2½%
Mortar and Street.....75&7½&2½%
Planters', Regular Pat'n.70&30%
Cotton.....75&7½%
Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco.70&10&5%
Extra 20%

Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.

Ft. Madison Cotton Hoe.....75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. $5.00
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $6.00
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....60%
W. & C. Ivanhoe.....75&2%
B. B. Cultivator Hoe.....75&10&2%
Acme Weeding.....75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Empire.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&5%

Hooks— Cast Iron—

Bird Cage, Reading.....66%
Bird Cage, Sargent's List.....60%
Ceiling, Sargent's List.....40&10%
Clothes Line, Hoffman's.....40&10%
Clothes Line, Reading List 65&10@65&10&10%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List.....45&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Wrightsville.....65%
Harness, Poffman.....per doz. 35@40c
Harness, Reading List.....70&10@75%

Wire—

Belt.....*80%*
Wire C. & H. Hooks.50&10@60&10&10%
Atlas, Coat and Hat:
Single Cases.....50%
10 Case Lots.....50&10%
Czar Harness.....50&10&5%

Wire Coat and Hat:
Acme....60%
B. B....60%
V Brace, Chief and Czar....60%
Gem....60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton....doz. $1.05@1.25
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass.....Nos. 1 2 3 4
Best.....$1.50 1.75 2.00
Common.....$1.30 1.50 1.60
Potato and Manure.....66⅔&20%
Whiffletree.....lb. 5½c
Hooks and Eyes:
Brass.....60c&10c&10@70%
Malleable Iron.....70c&5@70c&10%
Covert Saddlery Works' Self Locking Gate and Door Hook....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net
Crown Picture....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—

See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition....ft. 4¼@ 4¾c
3-ply Standard.....ft. 6 @ 6½c
4-ply Standard.....ft. 7½@ 8 c
3-ply extra.....ft. 8½@ 9 c
4-ply extra.....ft. 10½@11 c
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 6 @7 c
Fair quality.....ft. 8 @9 c

Irons—Sad—

From 4 to 10.....lb. 2½@3c
B. B. Sad Irons.....lb. 3@3½c
Chinese Laundry.....lb. 4¾@5c
Chinese Sad.....lb. 3¾@4c
Mrs. Potts', per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Top	*71c*	*71c*	*81c*	*81c*
Tin'd Tops	*77c*	*77c*	*87c*	*84c*

New England Pressing, lb..3½@3¾c

Pinking—

Pinking Irons.....doz. 50@60c

Soldering—

Soldering Coppers ⅛ and 3..2¼@22
1½ and 2.....23@24c
Covert Mfg. Co....20&2½

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw....30&5%
Steel....45&2%
Covert's Saddlery Works':
Daisy....60&10%
Victor....60&10%
Lockport....50%
Lane's Steel....30&10%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c....30%
Hartzell Cutlery Co....50%
Smith & Hemenway Co....40&10%
Hay and Straw—See *Hay Knives.*

Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....70&5@70c&10%
Brayley's....
C. E. Jennings & Co. Nos. 45, 46...60&10%
Jennings & Griffin, Nos. 51, 52...60&10&10%
Swan's....70&10&2½%
Watrous....16⅔&10%
L. & I. J. White....20&5@25%

Hay and Straw—

Lightning....₱ doz. $6.50@7.00
Iwan's Sickle Edge....₱ doz. $10.00
Iwan's Serrated....₱ doz. $10.00
Maine....₱ doz. $8.50

Mincing—

Buffalo....₱ gro. $13.00

Miscellaneous—

Farriers'....doz. $2.00@3.00
Woolenholm's....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip, gro.....$1.10@1.20
Carriage, Jap, all sizes...gro. 25@30c
Door, Mineral.....doz. 65&70c
Door, Por. Jap'd.....doz. 70@75c
Door, Por. Nickel....doz. $2.05@2.15
Hardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's....60&10%

Lacing Leather—

See *Belting Leather—*

Ladders Step Etc.—

Lane's Store....25%
Myers Noiseless Store Ladders....50%

Ladles—Melting—

L. & G. Mfg. Co....25%
P. S. & W....50%
Reading....60%
Sargent's....45&10%

Lanterns—Tubular—

Regular Tubular No. 0...doz. $4.35@4.75
Lift Tubular...No. 0...doz. $4.75@5.25
Hinge Tubular. No. 0...doz. $4.75@5.25
Other Styles.....40c&10%&40c&10&5%

Bull's Eye Police—

No. 1, 2¾ inch.....$2.50@2.75
No. 2, 3 inch.....$2.75@3.00

Latches—Gate—

Hoffman's Safety Gate.....₱ doz. 60c

Thumb—

Roggin's Latches, with screw...dz. 35@40c

Leaders. Cattle—

Small.....doz. 55c; large, 60c
Covert Mfg. Co.....45&2%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos...	*18*	*19*	*20*
100 feet.....	*$2.20*	*2.00*	*1.65*
75 feet.....	*$1.80*	*1.70*	*1.30*

Oswawan Mills.....
Crown Solid Braided Chalk.....33⅓%
Mason's, No. 0 to No. 5.....33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3.....10%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr.....30%
Anniston Waterproof Clothes, 50 lt., ₱ gro.: $22.00; Gilt Edge, $30.00; Air Line $20.00; Acme, $15.00, Alabama, $15.00; Empire, $13.50; Advance, $13.50; Alliston, $11.50; Calhoun, $10.00; Oriole, $20.00; Albermarle, $25.50; Eclipse, $11.00; Chicago, $10.00; Standard, $9.00; Columbia, $8.00.

Locks—Cabinet—

Cabinet Locks.....33⅓@33⅓&c&7½%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co.....50%
R. & E. Mfg. Co.....40%
Sargent & Co.....40@40&10%

Elevator—

Stowell's.....40%

Padlocks—

Wrought Iron.....7c&10c&5@30c&5%
R. & E. Mfg. Co. Wrt. Steel and Brass.....75@75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....55&7½%
Crescent.....50%
Iron.....60&2½%
Wrought Bronze and Brass.....50&5%
Wrought Steel.....55%
Reading.....6c&10&10&10%

Machines—Boring—

Com., Upright, Without Augers...$2.00
Com., Angular, Without Augers...$2.25
Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3	$4.25	No. 1 $5.00
Improved No. 4	3.75	No. 2 3.38
Improved No. 5	2.75	
Jennings'...No. 4	3.15	No. 1, 3.50
Millers' Falls		5.15
Snell's, Rice's Pat.	2.50	2.75

Holsting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.20%
Moore's Portable Pneumatic Hoist....35%

Ice Cutting—

Chandler's.....15&10%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1; Boss Rotary	$57.00
Boss No. 7; Dietz Rotary	60.00
Champion Rotary; Banner No. 1	54.00
Standard Champion No. 1	48.00
Standard Perfection	36.00
Cinti Square Western	30.00
Uneeda American, Round	29.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45c&5@50%
Tinners', Hickory and Applewood, doz.....50@55c

Mats—Door—

Elastic Steel (W. G. Co.).....10%

Mattocks—

See *Picks and Mattocks.*

Menders Hose

Robinson's Hose Menders.....₱ gro, $2.00

Milk Cans—See *Cans, Milk*

Mills—Coffee, etc.—

Enterprise Mfg. Co.....35@30%
Hoffman's Side, Coffee and Spice.....₱ doz. $1.25
National, list Jan. 1, '94.....30%
Parker's Columbian & Victor a.50&10@60%
Parker's Box and Side.....50&10@60%
Sun. No. 1080, 1 lb mill.....₱ doz, $3.00
Swift, Lane Bros Co.....30%

Mowers, Lawn—

Net prices are generally quoted.
Cheap.....all sizes. $1.90@1.95
Good.....all sizes, $2.25@2.50

	10	*12*	*14*	*16-inch*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Continental.....60&10%
Great American.....7%
Great American Ball Bearing.....60&10%
Quaker City.....70%
Pennsylvania.....60&10%
Pennsylvania Ball Bearing.....60&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....40%
Pennsylvania Pony.....45%
Philadelphia:
Styles M., S., C., K., T.....70&10%
Style A, all Steel.....60&10%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, low list...50&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899. .85c&10c&10&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25¢	23¢	22¢	21¢	21¢	40&5%
Ausable	28¢	28¢	25¢	24¢	23¢	50&10%
C. B. K.	25¢	25¢	22¢	21¢	21¢	40%
Champ'in	28¢	26¢	25¢	24¢	23¢	40&10&5%
Clinton	19¢	17¢	16¢	15¢	14¢	30&10&5%
Maud S.	25¢	23¢	22¢	21¢	21¢	50%
Putnam	23¢	21¢	20¢	19¢	18¢	33⅓&5%

Putnam
Cold Rol'd 19¢ 18¢ 17¢ 16¢.....10&10%
American, Nos. 5 to 16 ₱ lb.....10@10½c
Nonpareil.....Nos. 5 to 10¢ ₱ lb 12¢
Jobbers' special brands...per lb. 8@9c

Picture

	1¼	*2*	*2½*	*3*	*3½ in.*
Brass Head.	*.45*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head.	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Crown Picture Nails.....₱ gro. $1.50

Nippers, See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain.....$4.50
Hexagon, plain.....$5.00
Square, C. T. & R.....$5.70
Hexagon, C. T. & R.....$6.00
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank.....$4.80
Hexagon Blank.....$5.00
Square Tapped.....$4.60
Hexagon Tapped.....$4.80

Oakum—

Best or Government.....lb. 6¼c
Navy.....lb. 4¾c
U. S. Navy.....lb. 5½c
Plumbers' Spun Oakum.....3¾c
In carload lots ¼c lb. off f. o. b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....65@65c&10%
Tin or Steel.....70c&10@75%
Zinc.....75@75c&10%
Chase or Paragon:
Brass and Copper.....65c&5@65c&10%
Tin or Steel.....75@75c&10%
Zinc.....70@70c&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz.20%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70&70&10%
Railroad Oilers etc.....60&60&10%

Openers—Can—

French.....doz. 35c
Iron Handle.....doz. 25@27c
Sprague, Iron Hdle., per doz. 35@40c
Sardine Scissors...doz. $1.75@$3.00
Marvel.....per doz. $1.25
National.....50%
Stowell's.....per doz. 35&45c
Tip Top.....per doz. $0.75

Egg—

Nickel Plate.....per doz., $2.25
Silver Plate.....per doz., $3.50

Packing—

Asbestos Packing, Wick and Rope, 15@15½c lb.

Rubber—

Sheet, C. I.....8@12c
Sheet, C. O. S.....9@15c
Sheet, C. B. S.....10@14c
Sheet, Pure Gum.....50@70c
Sheet, Red.....35@40c
Jenkins' standard, ₱ lb 80¢....25@25&5%

Miscellaneous—

American Packing.....7@10c lb.
Cotton Packing.....13@14c lb.
Italian Packing.....9@12½c lb.
Jute.....3½@4c lb.
Russia Packing.....7@11c lb.

Pails—Creamery

S. S. & Co., with gauges.. No 1 $6.25; No. 2, $5.50 ₱ doz.

Galvanized—

Price per doz.

Quart.....	*10*	*12*	*14*
Water, Regular..	*1.50*	*1.75*	*2.00*
Water, Heavy....	*2.75*	*3.00*	*3.25*
Fire, Rd. Bottom.	*2.30*	*2.60*	*2.80*
Well.....	*2.25*	*2.50*	*2.75*

Pans—Dripping—

Standard List.....60c&5@60&10%

Fry—

Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.95*	*1.05*	*1.15*	*1.30*	*1.65*

Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20 $5.75; 30, $6.25.
Simplex, ₱ doz.:

No.	40	50	60	140	150	160
	$2.75	3.25	3.75	3.00	3.25	4.00

Paper—Building Paper—

Asbestos:	*lb.*
Building Felt.....	*2¾c*
Mill Board, sheet, 40 x 40 inches	*3¼c*
Mill Board, roll, thicker than 1-16 inch.....	*3¼c*
Mill Board, roll, 1-16 in. thick and less.....	*2½c*
	Per roll
Rosin Sized Sheathing: 500 sq. ft.	
Light wt., 25 lbs. to roll..$0.43@0.50	
Medium wt., 30 lbs. to roll..$0.48@0.55	
Heavy wt., 40 lbs. to roll..$0.68@0.75	
Black Water Proof Sheathing, 500 Sq ft. 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 2, 3, 6 and 4½ sq. ft. to lb., ton.....$45.00	
Red Rope Roofing, 250 sq. feet per roll.....$1.65	

NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.

1 ply (roll 400 sq. ft.), ton..$32.50@35.00
2 ply, roll 1 lb sq. ft.....60@65c
3 ply, roll 1 lb sq. ft.....82@87c
Slater's Felt (roll 500 sq. ft.).....75c
NOTE.—*Above prices often include delivery.*
R. I. W. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.75

Sand and Emery—

Flint.....60@6& c&10%
Garnet.....25@20@15%

Parers—Apple—

Advance.....₱ doz. $4.50
Baldwin.....₱ doz. $5.00
Bonanza Improved.....each $6.50
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.50
Reading 72.....₱ doz. $4.00
Reading 78.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.75
White Mountain.....₱ doz. $6.00

Potato—

Saratoga.....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Paris Green—

Less than 1 for..	*per lb.*
Arsenic kegs or casks.....	*12½c*
Kegs, 100 to 175 lbs.....	*13 c*
Kits, 14, 28, 56 lbs.....	*14 c*
Paper boxes, 2 to 5 lbs.....	*14 c*
Paper boxes, 1 lb.....	*14½c*
Paper boxes, ½ lb.....	*15 c*
Paper boxes, ¼ lb.....	*16 c*

1 to 5 tons, 1 cent per lb. less; 5 tons and over, 1½ cents per lb. less.

Picks and Mattocks—

List Feb. 25, 1899.....65c&10@70%

Pinking Irons—

See *Irons, Pinking.*

Pins—Escutcheon—

Brass.....60@65c&10%
Iron, list Nov. 11, '85.....60@60c&10%

Pipe, Cast Iron Soil—

Standard, 2-6 in.....50c&10%
Extra Heavy, 2-6 in.....65%
Fittings.....70%

Pipe, Merchant,

Steel or Iron, Carload Lots,

f.o.b, Pittsburgh.	*Black.*	*Galvanized.*
Merchant Pipe.		
½, ¼, ⅜ inch.....	*63%*	*58%*
½-inch.....	*70%*	*60%*
¾ to 6 inch.....	*75%*	*65%*
7 to 12 inch.....	*73%*	*59%*

Less than carloads, 12½% advance.

Pipe Sewer—

Jobbers' Prices—

Standard Pipe and Fittings, 2 to 24 in.
New England.....70%
New York and New Jersey.....73%
Maryland, Delaware, East Penn.75%
West Penn and West Va.....76%
Virginia.....78%
Ohio, Michigan and Ky.....78%
Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints..	$7.50	$8 50
6 in., per 100 joints....	8.00	9.00
7 in., per 100 joints....	9.00	10.00

Planes and Plane Irons—

Wood Planes—

Bench, First quality....40c&5@40c&10%
Bench, Second qual. ...50c&5@50c&10%
Molding.....33⅓c&5@33⅓c&10%
Bailey's (Stanley R. & L. Co)
5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50@50&10%
Molding.....33⅓@33⅓&10%
Toy and Lowerman.....40@40&10%
Gage Self Setting.....35%
Union.....60%

Iron Planes—

Bailey's (Stanley R. & L. Co).....
25&10@25&10&10%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10@20&10&10%
Sargent's.....60%
Union.....60%

Plane Irons—

Wood Bench Plane Irons.....
30c&5@30c&10%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Stanley R. & L. Co...30&10@20&10&10%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse.....₱ doz. $8.50

Plates—

Felloe.....lb. 3¾@4c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers.....75@75c&10%
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45

Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$1.75	*$2.00*	*$2.75*	*$3.75*

Acme Nippers.....50@50&5%
Bernard's:
Parallel, Pliers.....95%
Paragon Pliers.....50&5%
Lodi Pliers.....50&5%
Elm City Fence Pliers.....35%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Improved Button.....70&10%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers, 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor 40@40&10&10%
Pocket Levels.....30@30&10&10%
Level Glasses.....60@60&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....25&10%
C. E. Jennings & Co.'s Iron, Adjustable.....33⅓&10%
Stanley R. & L. Co...0&10@30&10&10%

Stanley's Duplex.....20@20&10@10%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $ .00; No. 3, $ .00; No. 4, $12. 0.... .....; 50%

Points, Glaziers'—

Bulk and 1 lb. papers.. lb. 8½c@..
½-lb. papers..... lb. 9 c@..
¼-lb. papers.....lb. 9½c@..

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ ℔ boxes, ₱ doz. $1.25; 1 ℔ boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 ℔ cans ... ₱ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ ℔ cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ ℔ 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 ℔ pail.....each 70¢
Black Silk, ½ ℔ box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round .....gro. $10.00
1½ qt., Square.....gro. 11.00
2 qt., Square..... ..... gro. 13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6 4 ft., 44¢.
Steel Hitching Posts, each.....$1.30

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb. each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each.....25c
King's Semi-Smokeless:
Keg (25 ℔ bulk).....$6.50
Half Keg (12½ ℔ bulk).....$3.50
Quarter Keg (6¼ ℔ bulk).....$1.90
Case 24 (1 ℔ cans bulk).....$8.50
Half case (12 ℔ cans bulk).....$4 50
King's Smokeless: Shot Gun Rifle
Keg (25 ℔ bulk)..... $12 00 $15.00
Half Keg (12½ ℔ bulk) 6.25 7.75
Quarter Keg (6¼ ℔ bulk) 3.25 4.00
Case 24 (1 ℔ cans bulk).. 14.00 17 00
Half case 12 (1 ℔ cans bulk) 7.25 8 75
Robin Hood Shot Gun.....50&20%

Presses—Fruit and Jelly—

Enterprise Mfg. Co.....20@25%
Sensible.....33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%
Morrill's No. 2, per doz. $22 50 .....50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Cyclops.....50%
Miller's Falls, No. 3, per doz. $12.00.....33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $37.50.....50%
Pelican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $6.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4 50; No 3-D (small) $4.00.
Smith & Hemenway Co.:
Ajax.....60%
Diamond B, No. 2, case lots ₱ doz $6.00
Diamond B, No. 3, case lots ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....40%
Yankee.....66⅔%

Pulleys—Single Wheel—

Inch.....	*2*	*2½*	*3*
Awning...doz	*$0.55*	*.85*	*1.15*

Hay Fork, Swivel or Solid Eye..... doz., 4 in., $1.15; 5 in., $1.50

Inch	*2*	*2¼*	*2½*
Hot House.doz	*$0.70*	*.90*	*1.25*
Inch	*1¼*	*1½*	*1¾*
Screw.....doz	*$0.16*	*.19*	*.22*
Inch	*1¾*	*2*	*2¼*
Side.....doz	*$0 30*	*.40*	*.55*
Inch.....	*1½*	*1¾*	*2*
Tackle ....doz	*$0.50*	*.43*	*.58*

1.00

Stowell's:
Ceiling or End, Anti-Friction.....60%
Dumb Waiter, Anti-Friction...60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00.....50%
Electric Light.....60%
Side, Anti-Friction.....0&10%

Sash Pulleys—

Common Frame: Square or Round End, per doz., 1¾ in., 13c; 2 in., 15c
Auger Mortise, no Face Plate, per doz. 1¾ in., 12c.; 2 in., 15c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.
Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox All-Steel, Nos. 3 and 7, 2½ in. ₱ doz 25¢
No. 9, 1¾ in.... .....₱ doz. 20¢
Extra for Plated Finish...₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing.....₱ doz 10¢
Grand Rapids All Steel Noiseless.....40%
Ideal No. 13.....1¾ in., ₱ doz., 16¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....75&10@80%
Wood.....50@50&10%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾* 4
	$3.30	*3.60*	*3.85*	*4.10* 4.50

Barnes Dbl. Acting (low list).....50%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co.....$18.00
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. H. Co.....20%
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Daisy Spray Pump.....₱ doz. $7.50
Myers' Spray Pumps.....50&10%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $3.75@4.00
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Morrill's No. 1 (A.B.C.), ₱ doz, $15.00 .50%
No. 2, ₱ doz. $22.50.....50%
No. 2, Metal, ₱ doz., $45.00.....50%
Bench Punch, each, $80.00 ... .50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

	½	⅝	¾ in.
	$1.70	*$2.10*	*$3 00 100 feet.*

Angular for Sq. Groove Wheels:

	Small	*Med.*	*Large.*
	$1.60	*1 95*	*2.70 100 feet.*

Sliding Door, Brnzed Wr't Iron, ft. 6½c
Sliding Door, Iron Painted.....3½@3c
Sliding Door, Wrought Brass, 1¼ in.....lb. 30c.. 30%
Allith Mfg. Co. Reliable Hanger Track ₱ foot.....10¢
Crong's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $3.90; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.....₱ ft. 4½¢
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....50%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard.....₱ ft. 4 ¢
Myers' Stayon Track.....50&10%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special.....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel.....90%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail.....1½¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, Plain...3½¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

Rakes—

Net Prices, Malleable Rakes:

	10	*12*	*14*	*16-tooth*
Shank.....	*$1.50*	*1.60*	*1.75*	*1.85*
Socket.....	*$1.55*	*1.60*	*1.95*	*2.10*

Steel, August 1, 1899, List.....10 & 5 & 20%
Malleable.....70@10@75&5%
Lawn Rake, Metal Head, per doz., 20 teeth.....$3.25@3.50
24 teeth.....$3.60@3.75
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.45
Lawn Queen, 24-tooth, ₱ doz.....$3.60
Paragon, 20 tooth, ₱ doz.....$2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$2.88
Malleable Garden, 14-tooth, ₱ doz..$2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5@70&10&5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10%
See also *Files.*

Razors—

Borasic.....60 & 10%
Fox Razors, No. 42, .. ₱ doz. $20.00) 40%
Fox Razors, No. 44, .. ₱ doz, $20.00)
Fox Razors, No. 82, Platina, ₱ doz.) 40&10%
-25.00
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 05.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%
Safety Razors.....40%

Safety Razors—

New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades.....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.) ₱ doz. $ 5.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $47.00

Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30 00
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼ 4008, Silver Rubber Popolo, Nickeled Popolo, Aluminum, German Silver, Bronze, 3-0 4 N, 1-0 N, 4 N to 8 PN.....33⅓%
6 RW, 102 P and RN, 202 P and PN.40%
G 9 P.....20%
24 N to 28 PN.....35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and PRN, 202 PR and 1 PR 5.... 50&5%
2904 N.....40&10&5%
5009 P and N.....50%
2904 P.....50&10&5%
2904 PN.....60%
0922 N.....40&10%
02084 N.....45&10&5%
Single Action Trout.....40&10%
986 P N, 802 and 802 N.....50&10%
Competitor, 304 and 1304 PN 35%
02084 P and PN.....40&5%
Safety and Salmon.....30%

Registers—*List Sept. 2, 1901.*

Black Jap.....
White Jap.....
Bronzed .....
Nickel Plated..... 7@10 @80%
Electro Plated.....
There is a good deal of irregularity in prices of Registers.

Registers, Cash—

Sun, No. 10, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

Revolvers—

Single Action.....85@90c
Double Act n, except 44 cal. $1.40@1.50
Double Action, 44 caliber..$1.60@1.65
Automatic ....$2 85@3.10
Hammerless.....$3.25@3.60

Riddles, Grain or Sand—

16 in., per doz.....$2.75@$3.00
17 in., per doz.....$3.00@$3.25
18 in., per doz.....$3.25@$3.50

Rings and Ringers—Bull Rings—

	2	*2½*	*3 Inch.*
Steel.....	*$0 70*	*0.75*	*0.80 doz.*
Copper..... 1.00		*1.10*	*1.35 doz.*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.25@4.50
Hill's Ringers, Gray Iron. doz. 55@60c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.50@5.75
Brown's Ringers..per doz. $0.75@1.00

Rivets and Burrs—

Copper.....50&10@50&10@5%
Iron or Steel:
Tinners'.....75@75&10%
Miscellaneous.....75@75&10%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's Stay.....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger, tarred or untarred...lb. 11 @12 c
Manila, ⅜-inch ... lb. 11½@12½c
Manila, ¼ & 5-16 in.... lb. 12½@13 c
Manila, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 12 @12½c
Sisal, 7-16 in. and larger lb. 9 @10 c
Sisal, ⅜-inch ... lb. 9½@10½c
Sisal, ¼ and 5-16 inch .lb. 10 @11 c
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 9 @10 c
Sisal, Tarred, Medium Lath Yarn.....lb. 8½@9½c
Cotton Rope:
Best ...½-in. and larger, lb. 13½c
Medium..½-in. and larger, lb. 11 c
Com ....½-in. and larger, lb. 9 c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6½c
Thread No. 2, ¼-in. and up, lb. 6 c
Yarn, ¼-in. and up.. lb. 5 @5½c
Old Colony Manila Transmission Rope, ₱ ℔ 17½¢

Wire Rope—

Galvanized.....40&5%
Plain.....45&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute .....40&5%
Sisal.....30%
Covert Saddlery Works. .....60&5%

Rules—

Boxwood.....60&10@60&10&5%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Miscellaneous.....50@50&10&10%
Combination.....55@55&10%
Stationers'.....10@10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50@50&10%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames ...30@30&10%
Diamond Saw & Stamping Works:
Steering Kitchen Saws.....25%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in wide.....60%
Hand, ¼ to 2¾.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 79, 77, 8.....25%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Keynole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s.:
Back Saws.....25&10%
Butcher Saws.....35 &10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20@25&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Han l Saws, Bay State Bran l.....45%
Compass, Keyhole, &c .....25@25&7½%
Wood Saws.....35@35&7½%

Hack Saws—

Atkins' Hack Saw Blades A A A. ... 30%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....25%
Sterling Hack Saw Frames.....20%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Bishop's Lightning ... .₱ doz. $3 00
Covert's Sad Iron Works .....60&10%

Scales—

Family, Turnbull's.....30@30&10%
Counter:
Hatch. Platform, 4 oz. to 1 lbs. doz $5.50
Two Platforms, ½ oz to 8 lbs. doz, $16
Union Platform, Plain...$1.70@1.90
Union Platform, Striped $1.35@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables 45%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle.....doz. $2.25@2.50
Box, 2 Handle.....doz. $3.00@3.50
Ship Light, $2.50; Heavy, $4.00
Adjustable Box Scraper (S. R. & L. Co.) $6.00 .....30@30&10%
Chapin-Stephens Co., Box.....50@50&10%

Screens, Window, and Frames—

Flyer Pattern Window Screen...60@60&5%
Maine Window Screen Frames ..40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames....60&5%
Porter's:
Fairview Window Screens ..... 60&5@60&5&2½%
Hummer Window Screens..... 60&5@60&5&2½%
Klondike Window Screens..... 60&5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand

Bench, Iron..doz. 1 in.. $2.75@3.00 :
1⅛, $3.25@3.50 : 1¼, $3.85@4.25
Bench, Wood, Beech..doz. $3.00@3.50
Hand, Wood. ..30@30&5%
R. Hiles Mfg. Co, Hand..30%
Chapin-Stephens Co., Hand....30@30&10%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....70¢15@..%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....70¢10@..%
Hand Rail, list Jan. 1, '81.60¢10@..%

Jack Screws—

Standard List.....75¢10@80&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P, S. & W.....50@50&10%
Sargent.....70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50¢10%
Flat or Round Head, Brass50@50¢10%

Set and Cap—

Set (Iron or Steel).....70%
Sq. Hd. Cap.....65%
Hex. Hd. Cap.....65%
Rd. or Fillister Hd. Cap.....60%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts :
Flat Head, Iron.....87½¢10@..%
Round Head, Iron.....85¢10@..%
Flat Head, Brass.....85¢10@..%
Round Head, Brass.....80¢10@..%
Flat Head, Bronze.....77½¢10@..%
Round Head, Bronze.....75¢10@..%
Drive Screws.....87½¢10%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Per doz.
Clipper Pattern, Grass..$4.50@$5.00
Full Polished Clipper.....$5.00@$5.50
Grain.....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Weed and Bush.....$4.75@$5.00

Seeders—Raisin—

Enterprise.....25@30%

Sets—Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdl..10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools doz. $2.50@2.60
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls....os. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18.... 15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30@30&10&10%

Garden Tool Sets—

Ft. Madison, Three Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$3.00

Nail—

Square.....*per gro. $2.25@2.50*
Round, Blk. and Pol., assorted.....*gro. $1.80@2.60*
Octagon.....*gro. $4.00@4.25*
Knurled, Good.....*gro. $5.75@6.00*
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70¢10@7½%

Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's.:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Saw and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.83.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 98, $15.84.....50%
No. 1 Old Style, $10.00.....50%
Giant Royal, Cross Cut.....₱ doz. $9.00
Royal Hand.....₱ doz. $5.40
Taintor Positive, ₱ doz. $18.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70%

Shaves Spoke—

Iron.....*doz. $1.00@1.15*
Wood.....*doz. $1.65@2.25*
Bailey's (Stanley R. & L. Co.)..... 50@50&10&10%
Chapin-Stephens Co.....50@50&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70¢10%
" *Nickel*.....60@60¢10%
Fair qual. Jap.....80@80¢5%
" *Nickel*.....75@75¢10%
Tailors' Shears.....40@40¢10%
Acme Cast Shears.....40@40&5%
Geneva.....60%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge.....1900 list 45%
Wilkinson's Framing.....40%
Wilkinson's Sheep.....1900 list. 25%

Tinners' Snips—

Steel Blades.....20¢5@20¢10%
Steel Laid Blades.....40¢10@5%
Forged Handles Steel Blades, Berlin 40@40&10%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch.....40&7½&10%
Niagara Snips.....40%
P., S. & W. Co.....20%

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25%
Disston's Pruning Hook, ₱ doz. $12.00.....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40¢10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller Hatfield's, Sargent's list.....70&10%
Reading.....70&10@75%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10%

Shells—Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge..65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, New Victor, Repeater, Yellow Rival, 10, 12, 13 and 20 gauge.....20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....30&10%

Shells, Loaded—

Loaded with Black Powder.....40%
Loaded with Smokeless Powder, medium grade.....40¢5%
Loaded with Smokeless Powder, high grade.....40¢10¢10%
Robin Hood, Low Brass.....50%
Robin Hood, High Brass.....50&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg:
Iron.....*per keg $3.85*
Steel.....*per keg 3.60*
Barden's, all sizes, ₱ keg.....$3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.40
Drop, B and larger, per 25-lb. bag$1.65
Buck, 25-lb. bag.....$1.65
Chilled, 25 lb. bag.....$1.85
Dust Shot, 25-lb. bag.....$2.00

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation, gro. $11.00@11.50
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

National Mfg. Co.:
Victor.....per gro, $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11.00
Shaker (Barler's Pat.) Flour Sifters, ₱ doz., $2.00.....20%

Sieves, Tin Rim—

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Black, full size	*$1.20*	*1.25*	*1.30*	*1.35*
Plated, full size	*$1.30*	*1.35*	*1.40*	*1.45*
Black, scant		*$0.95*	*1.00*	*1.05*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$1.65@0.75
Mesh 20, Nested, doz.....75@..85
Mesh 24, Nested, doz.....90@1.00

Sinks—

Cast Iron—

Standard list.....60@60¢10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins Wagon—

Cast Iron.....70@70¢10%
Malleable Iron.....40¢10@50%
Steel.....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....45%
Noiseless Slates.....60&4 tens &5%
Wire Bound.....40%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No, 10, $2.00.....33⅓

Snaps, Harness—

German.....40@40¢10%
Covert Mfg. Co.:
Deroy.....20&5&2%
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community :
Solid Steel.....60&5%
Solid Swivels.....60%
Sargent's Patent Guarded.....60%&10%

Snaths—

Scythe.....50@50&1%

Snips, Tinners'—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50¢10@60¢10¢5%
Cheap.....60@60¢10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand..60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 57 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver.....60@60&10%
Castaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 1..&10%

Tinned Iron—

Teas.....*per gro. 45@5.4c*
Tables.....*per gro. 90c@$1.00*

Springs—Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider :
Black or ⅛ Bright, lb.....5¼c
Bright, lb.....5½c
Painted Seat Springs :
1½ x 2 x 26 . per pr.....56@55c
1½ x 2 x 28 per pr.....60@65c
1½ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@20%
Macksey.....₱ doz. $1.80
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 8, $24.....30%

Squares—

Nickel plated.....*List Jan. 5, 1900.*
Steel and Iron.....70¢10%
Rosewood Hdl Try Squire and T-Bevels.....60¢10¢10@70%
Iron Hdl. Try Squares and T-Bevels. 50¢10@40¢10¢20%
Disston's Try Sq. and T-Bevel's.....70%
Winterbottom's Try and Miter..... 40&10%@40&10&10%

Squeezers—Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50 : No. 1. $6.25@$6.50.
Wood, Porcelain Lined,
Cheap.....*doz. $2.00@2.75*
Good Grade.....*doz. $3.00@3.50*
Tinned Iron.....*doz. $0.75@1.25*
Iron, Porcelain Lined doz. $2.90@3.25

Staples—

Barbed Blind.....*lb. 6@5½c*
Electricians', Association list..... 80¢10&10&10%
Fence Staples, See Trade Report.
Galvanized, 1c less than Barb Wire
Polished 20c less than Barb Wire.
Poultry Netting, Staples....per lb.. 2¼@3¼c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....30&5%
C. & A. Hoffmann's.....40%

Steelyards.....25¢10@30¢10%

Stocks and Dies—

Blacksmiths'.....40¢10@50%
Curtis Reversible Ratchet Die Stock, 25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.
Pike Mfg. Co. 1901 list:

	₱ gro.
Black Diamond S. S....	$12.00
Lamoille S. S.....	$11.00
White Mountain S. S....	$9.00
Green Mountain S. S....	$6.00
xtra Indian Pond S. S.	$7.50
No. 1 Indian Pond S. S.	$7.00
No. 2 Indian Pond S. S.	$4.50
Leader Red End S. S....	$4.50

Balance of 1901 list 33⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

	₱ lb.
Arkansas Stone, No. 1, 3 to 5¼ in.	$2.50
Arkansas Stone, No. 1, 5 to 8 in.	$3.50
Arkansas Slips No. 1.....	$4.00
Lily White Washita 4 to 8 i.....	60¢
Rosy Red Washita, 4 to 8 in.....	60¢
Washita Stone, Extra, 4 to 8 in.	50¢
Washita Stone, No. 1, 4 to 8 in.	40¢
Washita Stone, No. 2, 4 to 8 i..	30¢
Lily White Slips.....	90¢
Rosy Red Slips.....	90¢
Washita Slips, Extra.....	80¢
Washita Slips, No. 1.....	70¢
India Oil Stones (entire list).....	33⅓%

Hindostan No. 1, Regular.... ₱ lb 8¢
Hindostan No. 1 Small..... ₱ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, ex. 5 to 8 in. ₱ lb 80¢
Queer Creek Stones, 4 to 8 in.....20¢
Queer Creek Slips.....40¢
Sand Stone.....5¢
Belgian, German and Swiss Razor Hones.....50%
Natural Grit Carving Knife Hones, ₱ doz.....$3.00
Quick Edge Pocket Knife Hones, ₱ doz.....$2.00
Mounted Kitchen Sand Stone, ₱ doz.....$1.50

Stoners—Cherry—

Enterprise.....25@30%

Stops Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....2%

Straps—Box—

Cary's Universal, case lots.....20@10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@60c
Socket.....*doz. $1.75*

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Supports, Porch—

Hoffman's Porch Supports....₱ doz. 25c

Sweepers, Carpet—

National Sweeper Co.: Per doz.
Marion, Roller Bearing, regular finishes, full Nickel.....$24.00
Marion Queen, Roller Bearing, Fancy Veneers, full Nickel.....$27.00
Monarch, Roller Bearing, Nickel..$22.00
Monarch, Roller Bearing, Japanned.$20.00
Marion Queen, Roller Bearing, Regular Finishes, full Nickel.....$24.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....$32.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel.....$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned.....$32.00
Perpetual, Regular Bearings, Nkl.$20.00
Perpetual, Regular Bearings, Jap.$18.00
NOTE.—*Discount of 30c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American..... *90¢25¢5@....%*
American Cut Tacks 90¢20¢5@....%
Swedes Iron Tacks ...90¢30¢5@....%
Swedes Upholsterers' Tacks..... *90¢¼ & 90¢5@....%*
Gimp Tacks.....*90¢25¢5@....%*
Lace Tacks.....*90¢50@....%*
Trimmers' Tacks..90¢30¢10¢5@....%
Looking Glass Tacks....70¢10@....%
Bill Posters' and Railroad Tack.... *90¢45¢5@....%*
Hungarian Nails .80¢ 90¢5@....%
Common and Patent Brads....80¢10%
Trunk and Clout Nails...80¢5@....%
NOTE.—*The above prices are for Straight Weights.* An extra 5¢ is given Star Weights** and an extra 10¢5% on Standard Weights.****

Miscellaneous—

Double Pointed Tacks...90 and 5 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list..... 50&10@60%
See also *Nails, Wire.*

Tanks, Oil—

	Each.
Emerald, S. S. & Co.....30-gal	$3.40
Emerald, S. S. & Co.....60-gal.,	$4.25
Queen City S. S. & Co., 30-gal.....	$3.95
Queen City S. S. & Co., 60-gal.....	$4.50

Tapes, Measuring—

American Asses' Skin.....40¢10@5%
Patent Leather.....25@35¢5%
Steel.....40@40¢5%
Chesterman's.....25@25¢5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....33⅓&5%
Lufkin's Steel.....33⅓&5%
Lufkin's Metallic.....30@30&5%

Teeth Harrow—

Steel Harrow Teeth, plain or headed, ⅝ inch and larger, per 100 lbs..$3.00

Thermometers—

Tin Case.....80¢10@80¢10¢5%

Ties, Bale—Steel Wire.

Single Loop.....80¢2½%
Monitor, Cross Head, Etc.....70%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6½ in. ₱ 1000, $10.00
Galv. Steel 5-32 x 8½ in. ₱ 1000, $11.00
Galv. Steel 5-32 x 11½ in. ₱ 1000, $12.00
Galv. Steel 5-32 x 15½ in. ₱ 1000 $14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tools— Coopers'—
L. & I. J. White .....20@20&5%

Hay—
Myers' Hay Tools 50%

Saw—
Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—
L. & I. J. White.....25%

Transom Lifters—
See *Lifters, Transom.*

Traps— Fly—
Balloon, Globe or Acme.....
doz. $1.15@1.25; gro. $11.50@12.00
Harper, Champion or Paragon ...
doz. $1.25@1.50; gro. $13.00@13.50

Game—
Oneida Pattern.....80@30&5%
Newhouse.....45@45&5%
Hawley & Norton.....65&5@65&10%
Victor (Oneida Pattern).....75@75&5%
Star (Blake Pattern).....60&5@60&10%

Mouse and Rat—
Mouse, Wood, Choker, doz. holes....
8½@9c
Mouse, Round or Square Wire.....
doz. 85@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ℔ doz. $12.00
No. 3, Rat, ℔ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ℔ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ℔ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse, ℔ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ℔ gr. $30.00
No. 2, ℔ gr. $30.00; Mouse, No. 3, $18.00 .....50%
J. M Mast Mfg. Co.: Per gro.

	Mouse.	Rat.
Blizzard	No. 12, $3.00	No. 1, $9 50
Old Nick	No. 10, 2.22	No. 2, 8.40
Joker	No. 5, 2.10	No. 3, 8.40

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2 40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

Trimmers Spoke—
Bonney's Nos. 1 and 2..... 40%
Wood's E I.....50%

Trowels—
Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 3 in.....
℔ gro. $5.00
Kohler's Steel Garden Trowels, 6 in .....
℔ gro. $6.00
Never-Break Steel Garden Trowels.....
gro. $6.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough&McParlin,Pl'st'ring.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern.....5&10%
Western Pattern.....6&10%
Handy Trucks.....per doz. $16.00
Grocery.....per doz. $15.00
Daisy Stove Trucks, improved pattern ℔ doz. $18.50
Model Stove Trucks.....℔ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	$4.75	5.25	6.00

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz.	$5.25	6.00	6.75	6.50	7.00	8.00

Twine—Miscellaneous—

Flax Twine—	BC	B.
No. 9, ¼ and ½-lb. Balls	21½c	23½c
No. 12, ¼ and ½ lb. balls	17½c	19½c
No. 18, ¼ and ½-lb. Balls	15½c	17½c
No. 24, ¼ and ½-lb. Balls	15 c	17 c
No. 36, ¼ and ½-lb. Balls	14½c	16½c

Chalk Line, Cotton, ½-lb Balls....
22@22½c

Cotton Mops, 6, 9, 12 and 15 lb. to doz.....8c
Cotton Wrapping 5 Balls to lb ...
according to quality.....11c@17c
American 2-Ply Hemp, ¼ and ½-lb. Balls.....15@14c
American 3 Ply Hemp, 1-lb. Balls .....13@14c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....8c
India 3-Ply Hemp, 1-lb. Balls.....8c
India 3-Ply Hemp, 1½-lb. Balls.....7c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls...
8@7c
Mason Line, Linen, ½-lb. Balls.....15c
No. 20½ Mattress, ¼ and ½-lb. Balls 37c
Wool, 3 to 6 ply.....5@5½c

Binder—

	Cents per lb
Sisal	10¼
Standard	10¼
Standard Manila (550 ft.)	11
Manila (600 ft.)	12
Pure Manila (650 ft.)	13¾

F. o. b. Eastern Mill. Carload lots ¼ cent less.

Vises—

Solid Box..... 50&10@50&10@5

Parallel—
Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40%
Columbian Hdw. Co 40%
Emmert Universal:
Pattern Makers' No. 1.....$15.00 net
Pattern Makers' No 2.....$13.00 net
Machinist and Tool Makers'.....$15.00 net
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Keystone.....65&5%
Lewis Tool Co.....20&30%
Merrill's.....20%
Miller's Falls.....50&10&10%
Parker's:
Victor.....20&25%
Regulars.....20&25%
Vulcan's.....40&45%
Combination Pipe.....55&60%
Prentiss.....20@25%
Sargent's.....40%
Smith & Hemenway Co.:
Machinists.....40%
Jewelers.....33⅓%
Sneidker's X. L.....33⅓%
Stephens'.....33⅓%

Saw Fliers'—
Bonney's, No. 1, $13; No. 3, $16 .50&5%
Disston's D 3 Clamp and Guide, ℔ doz $30.....25%
Reading.....60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in, $7.00; 14 in., $8.00.

Miscellaneous—
Bignall & Keeler Combination Pipe Vise.....60%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

Wads—Price Per M.

B. E., 11 up	.60c
B. E., 9 and 10	.70c
B. E., 8	.80c
B. E., 7	.80c
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger	$1.70@1.75
Ely's P. E., 12 to 20	$3.00@3.25

Dis. 15%

Ware Hollow—

Cast Iron, Hollow—
Stove Hollow Ware:
Ground.....50c&10@60%
Unground.....60c&5@65%
White Enameled Ware:
Maslin Kettles.....70%
Covered Ware:
Tinned and Turned.....40%
Enameled.....50%
See also *Pots Glue.*

Enameled—
Agate Nickel Steel Ware, list Nov. 1, '01.....50&10%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—
Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45c	50c	55c	65c

Steel Hollow Ware.
Avery Spiders & Griddles .....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles.....65&5%
Never Break Kettles.....60%
Solid Steel Spiders & Griddles.....65&5%
Solid Steel Kettles.....60%

Warmers, Foot—
Pike Mfg. Co., Soapstone.....40@40&10%

Washboards—
Solid Zinc: ℔ doz
Crescent, family size, bent frame.$3.00
Red Star, family size, stationary protector.....$3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.65
Cable Cross, family size, stationary protector.....$2.90
Single Zinc Surface:
Salad, family size, open back perforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.25
Brass Surface:
Brass King, Single Surface, open back.....$3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—

Leather, Axle—
Solid.....85c&10@85c&10c&10%
Patent.....85c&10@85c&20%
Coil: ⅞ 1 1¼ 1½ *Inch.*
9c 10c 11c 13c *per 100*

Iron or Steel—

Size bolt	5-16	⅜	½	⅝	¾
Washers	$5.80	5.50	4.60	4.50	4.20

In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.

Cast Washers—
Over ½ inch, barrel lots, per lb.....
1¾@2c

Wedges—
Oil Finish.....lb. 2.90@3.10c

Weights—

Hitching—
Covert's Saddlery Works.....60&10%

Sash—
Per ton, f. o. b. factory:
Eastern District.....$26.00
Western, Central and Southern Districts.....$27.00

Wheels, Well—
8-in., $1.65@1.80; 10-in., $2.00@2.25; 12-in., $2.50@2.65; 14-in., $4.00@4.25

Wire and Wire Goods—
Bright and Annealed:
6 to 9.....72½&5@72½&10%
10 to 18.....72½&10&5@72½&10&5%
19 to 26.....75&10&2½@75&10&7½%
27 to 36.....75&10&7½@80&10&2½%
Galvanized:
6 to 18.....70@70&5%
19 to 26.....72½&5@72½&10%
27 to 36.....72½&10@72½&10&5%
Coppered:
6 to 9.....70&5@70&10%
10 to 18.....70&10@70&10&5%
19 to 26.....75&7½@75&10&2½%
27 to 36.....75&10@75&10&5%
Tinned:
6 to 14.....75@75&7½%
15 to 18.....72½&10@75%
19 to 26.....70&5@70&5&5%
27 to 36.....70@70&5%
Annealed Wire on Spools...70@70&5%
Brass and Copper Wire on Spools.
60@60&5%
Brass, list Feb. 26, '96.....25@30%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to £. 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List April 1, 1901.....85c&10c@90%

Wire Cloth and Netting—
Galvanized Wire Netting .....80c&10%
Painted Screen Cloth per 100 ft. $1.15
Light Hardware Grade:
2-8 Mesh, Plain (8c. list) sq. ft...
1¾@2c
2-8 Mesh, Galv. (8c. list) sq ft..2½@2¾c

Wire, Barb—See *Trade Report.*

Wrenches—
Agricultural .....80@80c&10%
Baxter Pat'rn S Wrenches
70c&5@70c&10%
Drop Forged S.....45@45c&5%
Acme .....60&10%
Alligator.....70%
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable S Pipe.....40%
Brigg's Pattern.....30&10%
Combination Black.....40&5%
Combination Bright.....40%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Boardman's.....33⅓%
Coes' Genuine .....40&10&5&5%
Coes' "Mechanics".....40&10&10&5&5%
Donohue's Engineer.....40&10%
Dudly Auto .....50&5&50&10%
Eagle.....50&10%
Elgin Wrenches.....40%
Elgin Monkey Wrench Pipe Jaws...33⅓%
Gem Pocket 30%
Hercules.....70%
W. & B. Machinist:
Case lots.....50&10%
Less than case lots.....50&5%
Improved Pipe (W. & B.).....60%
Solid Handles, P. S. & W .....50@50&5%
Stillson.....65%
Triumph.....60&10%
Vulcan Chain.....50%

Fruit Jar—
Triumph Fruit Can Wrenches, ℔ gro. $19.20 } 25
Syrup Cap Wrenches.....℔ gro. $8.00 } 25
T & B Fruit Jar Wrenches, ℔ gro $16.50
T & B Fruit Jar Holders..℔ gro. $30.00

Wrought Goods—
Staples, Hooks, &c., list March 17 '02.....30@30c&5%

Yokes Neck—
Covert Saddlery Works, Trimmed....70%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters', list net

Zinc—
Sheet.....lb 7 @7¼¢

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.
Lead, English white, in Oil.....7 @ 9¾
Lead, American White, in Oil:
Lots of 500 ℔ or over.....@ 6¾
Lots less than 500 ℔.....@ 7¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price.....@ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.....@ 1½
Lead, American, Terms: For lots 12 tons and over 1% rebate; an 1 2% f r cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls.....5½@ 6¼
Zinc, American, Dry.....℔ ton $4.00@5.00 4½@ 5½
Zinc, Paris, Red Seal, dry.....@ 8½
Zinc, Paris, Green Seal, dry.....@ 9½
Zinc, Antwerp Red Seal, dry.....@ 7½
Zinc, Antwerp, Green Seal, dry.....@ 8½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12¼
Lots of less than 1 ton.....12¼@12¾
Zinc, V. M. French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11 @11½
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.

Black, Carbon	℔	6 @10
Black, Drop, Amer.		4 @ 7
Black, Drop, Eng.		7 @15
Black, Ivory		15 @21
Lamp, Com.		4½@ 6
Blue, Celestial	℔	4 @ 6
Blue, Chinese		29 @32
Blue, Prussian		7 @30
Blue, Ultramarine		3½@15
Brown, Spanish		½@ 1
Brown, Vandyke, Amer.		1¾@ 2½
Brown, Vandyke, Foreign		2½@ 3½
Carmine, No. 40	℔	2.00@2.50
Green, Chrome, ordinary		3½@ 6
Green, Chrome, pure		17 @25

Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over.....@ 6¾
Lots less than 500 ℔.....@ 7¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over.....@ 6¾
Lots less than 500 ℔.....@ 7¼
Ocher, French Washed.....5 @ 7
Ocher, Dutch Washed.....5 @ 7
Ocher, American.....℔ ton $10.00@15.00
Orange Mineral, English..℔ ℔ 8@9½
Orange Mineral, French.....11 @11¾
Orange Mineral, German.....8½@9½
Orange Mineral, American ...8¼@8½
Red, Indian, English.....4½@8½
Red, Indian, American.....3 @3¼
Red, Turkey, English.....4 @6
Red, Tuscan, English.....7 @10
Red, Venetian, Amer..℔ 100 ℔. 50@1.50
Red Venetian, English.℔ 100 ℔.1.50@1 75
Sienna, Italian, Burnt and Powdered.....℔ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd.....3½@ 7½
Sienna, American, Raw.....1½@ 2
Sienna, American, Burnt and Powdered.....℔ ℔ 1½@ 2
Talc, French.....℔ 100 ℔ $1.25@1.50
Talc, American.....85 @1.10
Terra Alba, French, ℔ 100 ℔ .95 @1.00
Terra Alba, English .....95 @1.00
Terra Alba, American No. 1....65 @85
Terra Alba, American No. 2....45 @50
Umber, Turkey, Bnt. & Pow.℔ ℔ 2½@4 3½
Umber, Turkey, Raw & Powd. 2½@4 3½
Umber, Bnt. Amer.....1½@ 2
Umber, Raw, Amer.....1½@ 2
Yellow, Chrome.....11 @14
Vermilion, American Lead.....10 @10
Vermilion, Quicksilver, bulk ..@70
Vermilion, Quicksilver, bags...@71
Vermilion, English, Import..80 @85
Vermilion, Chinese.....$1.05@1.20

Colors in Oil.

Black, Lampblack		12 @14
Blue, Chinese		36 @40
Blue, Prussia		32 @35
Blue, Ultramarine		13 @16
Brown, Vandyke		11 @14
Green, Chrome		10 @15
Green, Paris		@21
Sienna, Raw		12 @15
Sienna, Burnt		12 @15
Umber, Raw		11 @14
Umber, Burnt		11 @14

Miscellaneous.

Barytes, Foreign,	℔ ton	$19.00@21.00
Barytes, Amer. Roasted		18.50@20.00
Barytes, Crude, No. 1		9.00@10.00
Chalk, in bulk	℔ ton	3.00@ 5.25
Chalk, in bbls	℔ 100 ℔	@ 35
China Clay, English	℔ ton	10.50@17.00
Cobalt, Oxide	℔ 100 ℔	2.26@ 2.50
Whiting, Common.	℔ 100 ℔	.48@ .55
Whiting, Gliders		.62@ .68
Whiting, extra Gliders'		.63@ .72

Putty.

In bladders	1¾@2½
In bulk	1½@2
In cans 1 ℔ to 5 ℔	2½@4¼
In cans 12½ ℔ to 25 ℔	1½@2¼

Spirits Turpentine.

In Southern bbls	49½@50
In machine bbls	50 @50½

Glue.

Cabinet	℔ ℔	11½@16
Extra White		18 @23
French		12 @40
Irish		13½@16
Low Grade		9 @12
Medium White		14½@16½

Animal, Fish and Vegetable Oils.

Linseed, City, raw	℔ gal.	.44 @ 45
Linseed, City, boiled		46 @47
Linseed, State and West'n, raw		42 @ ..
Linseed, raw Calcutta see l		75 @ ..
Lard, Prime		75 @76
Lard, Extra No. 1		58 @60
Lard, No. 2		45 @46
Cotton-seed, Crude, f. o. b mills		31 @33
Cotton-seed, Summer Yellow, prime		42½@43½
Cotton-seed Summer Yellow, off grades		38 @38½
Sperm, Crude		@ ..
Sperm, Natural Spring		67 @68
Sperm, Bleached Spring		68 @69
Sperm, Natural Winter		72 @73
Sperm, Bleached Winter		75 @77
Tallow, Prime		55 @56
Whale, Crude		@ ..
Whale, Natural Winter		46 @47
Whale Bleached Winter		48 @49
Menhaden, Brown, Strained		.30 @31
Menhaden, Light Strained		32 @33
Menhaden, Bleached Winter		34 @35
Menhaden, Ex Bleached Winter		36 @37
Cocoanut, Ceylon		5½@5¾
Cocoanut, Cochin		6 @6¼
Cod, Domestic		33 @35
Cod, Newfoundland		34 @ 0
Red Elaine		45 @46
Red Saponified	℔	5 @ 5¼
Olive, Italian, bbls		54 @ 60
Neatsfoot, prime		57 @58
Palm, prime, Lagos	℔ ℔	5½@ 6

Mineral Oils.

Black, 20 gravity, 25@30 cold test	℔ gal.	13 @14
Black, 29 gravity, 15 cold test.		13½@14½
Black, summer		12½@13½
Cylinder, light filtered		20½@21½
Cylinder, dark filtered		13½@19½
Paraffine, 903-907 gravity		15 @15½
Paraffine, 903 gravity		14 @14½
Paraffine, 883 gravity		11½@12
Paraffine, red, No. 1		15 @15½

In small lots ½¢ advance.

CURRENT METAL PRICES.

JUNE 3, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1¾ in. round and square..... ₩ lb. .... @2.20¢
1½ to 4 in. x ⅜ to 1 in..... ₩ lb. .... @2.40¢
1½ to 4 in. x ¼ to 5-16..... ₩ lb. .... @2.40¢
Rods—⅜ and 11-16 round and square. ₩ lb. .... @2.40¢

Angles:	Cts ₩ lb.
3 in. x ¼ in. and larger	2.30¢
3 in. x 3-16 in. and ⅛ in.	2.35¢
1½ to 2½ in. x ⅛ in.	2.35¢
1½ to 2⅜ in. x 3-16 in. and thicker	2.30¢
1 to 1¼ in. x 3-16 in.	2.35¢
1 to 1¼ x ⅛ in.	2.40¢
⅞ x ⅛ in.	2.25¢
¾ x ⅛ in.	2.45¢
⅝ x ⅛ in.	2.45¢
½ x 3-32 in.	3.05¢
Tees:	
1 in.	2.80¢
1¼ in.	2.60¢
1½ in. and larger	2.50¢
Beams	2.50@3.00¢
Channels, 3 in. and larger	2.50@3.00¢
Bands—1½ to 6 x 3-16 to No. 8	₩ lb. 2.40¢
"Burden's Best" Iron, base price	₩ lb. 3.05¢
Burden's "H. B. & S. Iron, base price	₩ lb. 2.85¢
"Ulster"	₩ lb. 3.15¢
Norway Bars	3.75@4.25¢
Norway Shapes	4.00@4.50¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	2.10¢
Toe Calk, Tire and Sleigh Shoe	2.30@3.00¢
Best Cast Steel, base price in small lots	7¢

Soft Steel Sheets—

¼ inch	2.50¢	No. 14	2.70¢
3-16 inch	2.50¢	No. 16	2.80¢
No. 8	2.50¢	No. 18	3.00¢
No. 10	2.50¢	No. 20	3.00¢
No. 12	2.60¢	No. 22	3.10¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	G. R. Cleaned.
Nos. 14 to 16	₩ lb. 2.90	3.0 ¢
Nos. 18 to 21	₩ lb. 3.00	3.10¢
Nos. 22 to 24	₩ lb. 3.10	3.20¢
Nos. 25 and 26	₩ lb. 3.20	3.30¢
No. 27	₩ lb. 3.30	3.40¢
No. 28	₩ lb. 3.40	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb. 11½@14¢
Patent Planished, ₩ lb. A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 ₩ lb. 3.24¢
Nos. 18 to 20 ₩ lb. 3.51¢
Nos. 22 to 24 ₩ lb. 3.78¢
No. 26 ₩ lb. 4.05¢
No. 27 ₩ lb. 4.32¢
No. 28 ₩ lb. 4.59¢
No. 30 ₩ lb. 5.67¢
No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast ₩ lb. 15 ¢
Extra Cast ₩ lb. 18 @ 20 ¢
Swaged, Cast ₩ lb. 16 ¢
Best Double Shear ₩ lb. 15 ¢
Blister, 1st quality ₩ lb. 13 ¢
German Steel, Best ₩ lb. 10 ¢
2d quality ₩ lb. 9 ¢
3d quality ₩ lb. 8 ¢
Sheet Cast Steel, 1st quality ₩ lb. 15 ¢
2d quality ₩ lb. 14 ¢
3d quality ₩ lb. 12 ¢
R. Mushet's "Special" ₩ lb. 46 ¢
" " "Titanic" ₩ lb. 19 ¢
Hobson's Choice XX Extra Best ₩ lb. 35 ¢
Jessop Self Hardening ₩ lb. 45 ¢
Seamans' "Nelson" Steel 40 ¢
Hobson's "Soho" Special Self-Hardening ₩ lb. 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per lb
Banca, Pigs	31 @31¼¢
Straits, Pigs	30¾@31 ¢
Straits in Bars	31⅛@31¾¢

Tin Plates—

American Charcoal Plates.

Calland Grade:
IC, 14 x 20 $8.75
IX, 14 x 20 8.25
Melyn Grade:
IC, 14 x 20 6.50
IX, 14 x 20 7.75
Allaway Grade:
IC, 14 x 20 5.50
IX, 14 x 20 6.60

American Coke Plates—Bessemer—

IC, 14 x 20 .....108 lb. .....$4.70@4.80
IX, 14 x 20 .....$5.00@5.25

American Terne Plates—

IC, 20 x 28 $9.50
IX, 20 x 28 $11.50

Copper—

Duty: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake 15½¢
Casting 15 ¢

Sheet and Bolt—

March 12, 1903. Net.

Prices, in cents per pound. Sheet 10 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60, and heavier.	32 oz. to 64 oz. 25 to 50 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7¾ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	20	21	21	21	22	23	24	27	30
30	96	72	20	21	21	21	22	24	27	30	
30	.....	96	20	21	21	21	23	27			
36	72	.....	20	21	21	21	23	25	28	31	
36	96	72	20	21	21	21	23	27	30		
36	120	96	20	21	21	22	24				
36	.....	120	20	21	21	23					
48	72	.....	20	21	21	23	25	28	31		
48	96	72	20	21	21	24	26	29			
48	120	96	20	21	23	25	29				
48	.....	120	20	22	24	27					
60	72	.....	20	21	22	24	27	32			
60	96	72	20	21	23	25	30				
60	120	96	20	22	24	27					
60	.....	120	21	23	25	29					
72	96	.....	20	21	24	29					
72	120	96	20	23	26	31					
72	.....	120	21	24	29						
108	96	.....	21	24	27						
108	120	96	22	25	28						
108	.....	120	23	26	30						
wider than 108	.....	132	24	27							
	.....	132	25	28							

Rolled Round Copper, ⅜ inch diameter and over, ₩ lb. 20¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ lb. advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb. over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb. over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ lb. advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb. advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb. more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb. .....25¢
12 oz. and up to 14 oz. to square foot, ₩ lb. .....26¢
10 oz. and up to 12 oz., ₩ lb. .....27¢
Lighter than 10 oz., ₩ lb. .....28¢
Circles less than 8 in. diameter, 2¢ ₩ lb. additional
Circles over 13 in. diameter are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1¢ ₩ lb. extra.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
List Feb. 23, 1903.

Nos.	0000 to 8 Base	9 and 10		11 and 12
		¼¢		⅛¢ ₩ lb. adv.
Nos.	13	14	15	16
	⅛¢	¼¢	½¢	1⅛¢ ₩ lb. adv.
Nos.	17	18	19	20
	1½¢	2¢	2½¢	2¾¢ ₩ lb. adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3-9	.....	.....	.....	.....	31	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	.....	41	37	35	33	31	30	29	28	27	25	24
15	13	.....	42	38	36	33	32	31	30	29	28	26	25
16	14	.....	43	39	37	34	33	32	31	30	29	26	25
17	15	.....	44	40	38	35	34	33	32	31	30	27	26
18	16	61	45	41	39	36	35	34	33	32	31	28	27
19	17	62	47	42	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	45	45	44	43	41	40	40	41
25	24	86	71	56	51	47	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb. additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	29	27	21	21	21	21	21	21	21	23	25	27	28	₩ lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb. additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Jan. 6, 1898.
Brown & Sharpe's gauge standard.

			Per lb.
Plain Round Tube, ¾ in.	up to	2 in.	$0.35
" " ⅞ "	"	2¼ "	.36
" " 1 "	"	2½ "	.38
" " 1⅛ "	"	2¾ "	.41
" " 1¼ "	"	3 "	.43
" " 5-16 "	"	3½ "	.48
" " 1½ "	"	5-16"	.65
" " 3-16 "	"	½"	1.00
" " ⅛ "	"	3-16"	1.50
Smaller than ¾ inch			Special
2 inch to 3 inch, inclusive			.35
3 inch			.40
Over 3 inch to 3½ inch, inclusive			.45
Over 3½ inch			.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5 ..... 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 2 12	in. 13 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24	in. 24 26
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.25	.25	.28	.30	.32	.34	.33	.39

Common High Brass Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	in. 40
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.
Add ½¢ ₩ lb. additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 25%

Wire in Coils.

List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilding bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 25%; Copper Wire, NET.
List November 16, 96.
Spring Wire, 2¢ ₩ lb. advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb., net ..... 19¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb. net, 20¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb.
Western Spelter ..... 6@6¾¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.
No. 9, base, casks ..... 7½¢ | Open, per lb ..... 8¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American Pig	4⅞@5¢
Bar	5⅛@5⅜¢
Pipe	6¾¢ ..... 20% off
Tin Lined Pipe	12½¢ ..... 20% off
Block Tin Pipe	40¢ net
Sheet Lead	7¾¢ ..... 20% off

Old Lead in exchange, 4¢ ₩ lb.

Solder.

½ & ¼, guaranteed ..... 20 @20½¢
No. 1 ..... 17½@19 ¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson	₩ lb. 8¼@8¾¢
Hallett's	₩ lb. 7¼@7½¢
U. S.	₩ lb. 7 @7½¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	₩ lb. 37¢
100-lb lots	₩ lb. 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:	
Small lots	₩ lb. 34¢
100-lb lots	₩ lb. 33¢

Aluminum Sheet, B. & S. gauge, 50 lb or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb.
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.57
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15	₩ lb 43¢
No. 9 to No. 10	₩ lb 40½¢	No. 17	₩ lb 50¢
No. 11	₩ lb 41 ¢	No. 18	₩ lb 55¢
No. 12	₩ lb 41½¢	No. 19	₩ lb 60¢
No. 13	₩ lb 43 ¢	No. 20	₩ lb 65¢
No. 14	₩ lb 43½¢	No. 21	₩ lb 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 11¼
Light and Tinned Copper	₩ lb 10⅜
Heavy Brass	₩ lb 8½
Light Brass	₩ lb 6½
Lead	₩ lb 3¾
Tea Lead	₩ lb 3½
Zinc	₩ lb 4
No. 1 Pewter	₩ lb 18½
No. 2 Pewter	₩ lb 8½
Pure Aluminum, Sheet, ₩ lb	21
Cast Aluminum, ₩ lb	16
Tin Plate Scrap	₩ ton $4.50@5.00
Wrought Scrap Iron	₩ gross ton $14.50@15.00
Heavy Cast Scrap	₩ gross ton $14.00@14.50
Stove Plate Scrap	₩ gross ton $10.00@11.00
Burnt Iron	₩ gross ton $9.00@10.00